THE SCHOOL REVIEW

A JOURNAL OF SECONDARY EDUCATION

VOLUME XII
NUMBER 8

OCTOBER, 1904

WHOLE
NUMBER 118

BOTANY AS A FACTOR IN EDUCATION.

THE topic is limited to secondary education, and falls naturally under two heads: (1) the special function of botany in secondary education; and (2) the general function of botany as a representative scientific study.

I. THE SPECIAL FUNCTION OF BOTANY IN SECONDARY EDUCATION.

The day has long passed when any argument is necessary to show that botany should have a place in secondary education. Its full importance is doubtless not appreciated by all constructors of school programs, or even by all students of education, but its place has been made secure. It is my purpose to present some of the reasons for the presence of botany in secondary schools, and these will indicate some of its special functions in a scheme of elementary education. Perhaps no science has suffered so much in public estimation from its history, for the idea that it is a "beautiful" subject, appealing to the æsthetic and the sentimental nature, rather than a serious subject full of hard work, seems to be firmly riveted in the minds of the generally informed. It is my judgment that the next generation, the one that is studying botany now, will largely correct this impression. My first reason for the presence of botany in secondary schools is—

1. *Plants enter very largely into human experience.*—This touches upon one of the fundamentals of elementary education; for it is certainly fundamental that such training must relate the pupil to his most common experiences. It is evident that one of the most obvious facts in this world is the vegetation that forms the natural covering of the earth's surface. One might almost as well omit any considera-

tion of air and of water and of sunlight as to omit any consideration of plants. Aside from the mere fact of the universal presence of plants, which thrusts them upon experience everywhere, one must also consider their enormous importance to human welfare to appreciate fully that they cannot be neglected.

2. *Plants reveal the fundamental laws of life.*—No science seems more worthy the study of man than biology, which seeks to explain his own physical life, and which introduces him to the subtlest processes of nature. It is evident now that the laws of life are the same for all organisms, whether they are plants, or ordinary animals, or man. Botany, therefore, is a biological science, and is to be so taught. Plants and animals are simply different illustrations of the same underlying principles; and, so far as biology is concerned, it is a secondary consideration which illustrations shall be used. All of the ordinary life-processes are common to both plants and animals, but for elementary instruction in biological principles plants have the advantage in at least four respects: (*a*) they are more available; (*b*) they are easier and pleasanter to handle; (*c*) they exhibit simpler illustrations of biological phenomena; (*d*) they add a life-process that is peculiar to them and of the utmost importance to the organic world, namely, the manufacture of food from inorganic material.

To get some fundamental conceptions of the life-processes into elementary education appeals to me as of the utmost importance. The utter vacuity of knowledge in regard to such matters shown by the average intelligent adult of today, leading to all sorts of crudities of speech and behavior, and even to astounding credulity in matters of serious belief, has brought me to the conviction that more science and less literature in secondary education would provide us with better-balanced adults.

3. *Plants are favorable for biological experiment.*—It must be understood that the fundamental biological conceptions cannot be obtained from the dissection of dead plants and animals alone, but must also be obtained—some would say, chiefly obtained—from experiments with living forms, such experiments as would be impossible in secondary schools with living animals. The application of stimuli of various kinds, and the responses; mistreatment in nutrition and the results; mutilation and regeneration; etc., etc., deal with fundamental con-

ceptions, to develop which only plants can be used in elementary training.

4. *Plants alone can give what are known in biology as mass-phenomena.*—Organisms not only lead their individual lives, but hold definite relations to one another and to their physical surroundings. For example, plants are not scattered at random over the surface of the earth, but are definitely organized into those communities known as associations. This large problem of mass adjustment can be displayed to the elementary student only by plants, and when his eyes are opened to it, every landscape becomes full of significance. This does not mean that the problems are easy of solution, but that they are recognized as problems full of suggestions, the chief result of which is some little conception of the larger phenomena of life.

5. *Conclusions.*—It must not be supposed that all of these things are gotten out of botany as taught in the secondary schools. The only claim is that all of these things are among the opportunities that botany offers. They will be taken advantage of according to the training and notions of the teacher. It might as well be understood in the outset that the subject of botany is so many-sided that no two competent teachers may approach it in exactly the same way. The important principles to be developed are common to all successful teachers, but the ways of getting at them are exceedingly various. It is worse than useless to attempt to make for the secondary school a course of botany uniform in all of its details. No thoroughly good teacher will approve of it throughout unless he has happened to make it himself; and this is right, for otherwise he would not be a thoroughly good teacher. It would be just as sane to attempt to have a uniform sermon preached in every pulpit of the land each Sunday morning. The only uniformity that could be secured in such a case would be a uniform subject, leaving each preacher absolutely free as to the method of its presentation. Botany is in exactly the same position in the secondary schools. We have the uniform subject, and the details of its presentation must be left to the teachers, to be determined by training and local conditions.

So far as I can see, only two things can be done or seem desirable: (1) the more competent teachers can continue writing books expressing their notions of presenting the subject, such books to be construed

merely as suggestions and advice to those who do not feel quite so competent; and (2) the universities can determine in a general way the amount and kind of contact with plants they will accept among their entrance requirements, leaving to the teacher the problem of methods and details. The independence and initiative of the individual teacher is a far more important principle to foster than uniformity even in college-entrance requirements.

I would not presume to dictate to any school the way in which botany must be taught; but I would count it a privilege, upon being made acquainted with the preparation of the teacher and the facilities at command, to suggest certain lines of work, from which as a rational being, knowing the conditions better than anyone else, he could make his choice. I would regard it as my chief function to guard inexperience against waste of time and energy, rather than specifically to direct. That school or that teacher which is held in the dictatorial grasp of some higher authority, which permits no expression of individualism in methods, which sternly represses all spontaneity and originality, which demands an automaton-like service, is pedagogically blighted.

II. THE GENERAL FUNCTION OF BOTANY AS A REPRESENTATIVE SCIENTIFIC STUDY.

There is a larger question involved than the specific contribution of botany to education, and that is the contribution of science in general. A consideration of this not merely develops certain needs in our educational system, but also suggests the real purpose and method of scientific study. The subject is too vast to be considered in so brief a paper, even in its important outlines, but two statements may not be out of place in this connection.

1. *One of the contributions of science to education is the cultivation of the scientific spirit.*—This is an attitude of mind that presents many phases, but I will speak concerning the significance of only one of these, namely, the scientific spirit keeps one close to the facts. One of the hardest things in my teaching experience has been to check the tendency of many students to use one fact as a starting-point for a flight of fancy that is simply prodigious. Such a tendency is corrected, of course, when facts accumulate somewhat, and flight in one direction is checked by a pull in some other direction. But

most of us have the tendency, and the majority are so unhampered by facts that flight is free. This exercise is beautiful and invigorating if it is recognized to be just what it is—a flight of fancy; but if it results in a system of belief, it is a deception. There seems to be abroad a notion that one may start with a single well-attested fact and by some logical machinery construct an elaborate system and reach an authentic conclusion, much as the world imagined for more than a century that Cuvier could do if a single bone were furnished him. The result is bad, even though the fact have an unclouded title. But it too often has happened that great superstructures have been reared upon a fact that is claimed rather than demonstrated.

We are not called upon to construct a theory of the universe even upon every well-attested fact, and the sooner this is learned the more time will be saved and the more functional will the observing powers remain. Facts are like stepping-stones; so long as one can get a reasonably close series of them he can make some progress in a given direction, but when he steps beyond them he flounders. As one travels away from a fact, its significance in any conclusion becomes more and more attenuated, until presently the vanishing-point is reached, like the rays of light from a candle. A fact is really only influential in its own immediate vicinity; but the whole structure of many a system lies in the region beyond the vanishing-point.

We must wonder what lies beyond, we must try our wings in an excursion now and then, but very much stress must never be laid upon the value of the results thus obtained.

Such "vain imaginings" are delightfully seductive to many people, whose life and conduct are even shaped by them. I have been amazed at the large development of this phase of emotional insanity, commonly masquerading under the name of "subtle thinking." Perhaps the name is expressive enough, if it means thinking without any material for thought. And is not this one great danger of our educational system, when special stress is laid upon training? There is danger of setting to work a mental machine without giving it suitable material upon which it may operate, and it reacts upon itself, resulting in a sort of mental chaos. An active mind turned in upon itself, without any valuable objective material, can certainly never reach any very reliable results.

It may not be that laboratory science in education is the only agency, apart from common-sense, which is correcting this tendency; but it certainly teaches most impressively by object-lessons which are concrete, and hence easiest to grasp, that it is dangerous to stray away very far from the facts, and that the farther one strays away, the more dangerous it becomes, and almost inevitably leads to self-deception.

2. *Science gives a training peculiar to itself, and one that is essential in every well-balanced education.*—The real educational significance of the training in laboratories devoted to science is very commonly overlooked, both by those who know nothing about it from personal experience, and even by those who are teachers of science. Many learn to go through the motions without appreciating the substratum of educational philosophy. Moreover, the knowledge of the educational significance of this special form of training has been slowly developed as the results have appeared.

Perhaps the earliest, and of course the most superficial, form of statement explaining the purpose of scientific study was that it teaches the laboratory method. The inference was that the sciences are of no particular educational advantage in themselves, but are merely useful in teaching a valuable method. In so far as this emphasized the fact that reading or reciting *about* science cannot be regarded as training *in* science, and in so far as it recognized that science is to be credited with introducing a revolutionary and invaluable educational method, the statement is true enough; but to regard these purely incidental results as being in any sense the end of scientific training is far enough from the mark. The laboratory method holds no more relation to science than do algebraic symbols to algebra; they both merely represent useful machinery for getting at the real results. And further, as has been shown, if the teaching of a method is the only function of science in education, when this method has been learned and has become universally applied, the special mission of science in education is at an end.

Another commonly stated advantage of training in science is that it cultivates the power and habit of observation. This is certainly true, but with equal certainty this result is not peculiar to scientific training, for it belongs to the laboratory method, and appears when-

ever the method is applied to any subject. It may be claimed that the most direct and tangible materials for observation fall within the province of science; but this is a difference of degree rather than of kind, and therefore the result may be obtained apart from science.

Those who are accustomed to look a little beneath the surface before formulating a statement are very apt to be content with saying that the study of science trains in the power of analysis. This is certainly getting the subject upon higher ground, and suggests a result which is worthy of every effort. The power of analysis is one of immense practical importance, and the value of its cultivation will not be denied. To imagine, however, that analysis is the ultimate purpose of science is not to go very much farther than to say that its ultimate purpose is the laboratory method. The latter is the method, the former is but the first step in its application. But even this step is by no means peculiar to science, for it is the initial one in the teaching of every subject. In our search, therefore, for the peculiar benefits of science in education, we are again compelled to look further.

Beyond analysis lies synthesis, and this certainly represents the ultimate purpose of science. The results of analysis are as barren as a bank of sand until synthesis lays hold of them. It is just here that a large amount of science-teaching fails, for to many teachers the accumulation of unrelated facts seems to be the end of scientific study, and the results of the laboratory may be represented by a chaotic pile of brick rather than some definite structure dominated by an idea. Almost anyone may accumulate facts, but to relate them, to distinguish the significant and the insignificant, to recognize that they are merely external expressions of something general, belongs to the highest stretches of scientific training. May I be permitted to say, without being misunderstood, that the potent influence of the German laboratories upon American establishments has resulted in general in making our best investigators and our worst teachers? The influence is beneficent to the last degree in so far as it lays hold of a disposition to careless work and hasty generalization, and holds it down to the patient collection of facts and their very cautious collocation; but when it results in mere Gradgrind teaching, all inspiration has evaporated and the laboratory touches no more the finer mental powers than does a factory.

But even synthesis is not peculiar to science. To pass by the incidental and temporary and reach the real and permanent contribution of science to education is to discover that it lies, not in teaching the laboratory method, in developing the power of observation, in cultivating the spirit of analysis, or even in carrying one to the heights of synthesis; but in the mental attitude demanded in reaching the synthesis. In this regard the demands of science are diametrically opposed to those of the humanities, for instance, using this loose term to express the great region of literature and its allies.

The humanities have been and must continue to be a noble course of intellectual development, without which an education is certainly incomplete. It is the most ancient and best-known form of culture. and, being ancient and bound up with the intellectual development of mankind, it must necessarily continue to hold high rank. The general effect of the humanities in a scheme of education may be summed up in the single word "appreciation." They seek so to relate the student to what has been said or done by mankind that his critical sense may be developed, and that he may recognize what is best in human thought and action. To recognize what is best involves a standard of comparison. In most cases this standard is derived and conventional; in rare cases it is original and individual; in no case is it founded in the essential nature of things, in absolute truth, for it is apt to shift. In any case the student injects himself into the subject; and the amount he gets out of it is measured by the amount of himself he puts into it. It is the artistic, the æsthetic, which predominates, not the absolute. It is all comparative rather than actual. The ability to read between the lines is certainly the injection of self into the subject-matter, and the whole process may be regarded as one of *self-injection* in order to reach the power of *appreciation*.

My claim is that any education which stops with this result is an incomplete one, and that there is another mental attitude which is a necessary complement before a full-rounded education can be claimed; and that this complementary mental attitude is developed by a proper study of the sciences. If the study of nature is conducted so as to cultivate merely a sentimental appreciation of natural objects, it does not fall within the category I am considering, and can in no way be considered as a study which acts as a complement to the humanities.

It is merely more of the same thing. If the proper intellectual result of the humanities is *appreciation*, whose processes demand *self-injection*, the proper and distinctive intellectual result of the sciences is a *formula*, to obtain which there must be rigid *self-elimination*. Any injection of self into a scientific synthesis vitiates the result. The standard is not a variable, an artificial one, developed from the varying tastes of man, but absolute, founded upon eternal truth.

Two such distinct mental attitudes as self-injection and self-elimination must receive attention in education, which cannot be complete without both. They are not contradictory, but complementary, and it takes both to make the "all-round" man. The exclusive cultivation of either one must result in a lop-sided development. Persistent self-injection tends to mysticism, a confusion of ideals or even vagaries with realities, a prolific cause of all irrational beliefs. Persistent self-elimination narrows the vision to a horizon touched by the senses and clips the wings that would carry us now and then beyond the treadmill of life into a freer air and a wider outlook.

The one needs the other as a check. In their combination self-injection is held back from dangerous flights by the demand to feel something solid beneath the feet; and self-elimination is compelled to raise its eyes now and then from the ground and sweep the heavens.

In our analysis, however, we strip off the flesh and lay bare the skeleton, and are apt to lose sight of the fact that the contour is a composite result. Although the skeletons of the humanities and of the sciences may differ from each other in the fundamental way described, I cannot conceive of the resulting contour of the one as distinct from combination with the other. The self-eliminating result of science must be associated with the self-injecting result of the humanities, even though science alone be studied; and the power of appreciation developed by the humanities must always be tempered by the scientific spirit. And yet the two processes and the two results are so distinct and so complementary that any scheme of education which does not provide for the definite cultivation of these two mental attitudes, and which leaves the complementary part merely to the chances of methods of teaching and mental structure, is in constant danger of resulting in mental distortion.

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GRAPHICAL REPRESENTATION IN ARITHMETIC AND ALGEBRA.

WHEN an experience is strange to us, we try to find points of similarity with more familiar experiences; and we call the new facts by the names, and represent them by the ideas, of the old facts with which we are already well acquainted. Such, in general, are all scientific theories: they systematize our new knowledge, and suggest advances. Similar advantages are derived from geometric representation of numerical relations. By this means ideas otherwise abstruse are endowed with the reality that belongs to parallel ideas in visible form. When we consider that the whole structure of modern mathematics, even in its most abstruse branches, is largely dependent upon geometric representation, it would be strange if teachers should hesitate to use diagrams freely for representing the ideas of elementary arithmetic and algebra.

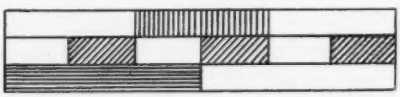

FIG. 1.—Reduction to a Common Denominator.

The most important use of geometric representation in arithmetic is for multiplication. The product-rectangle, divided into strips of unit squares, is found in most text-books of arithmetic—the multiplicand being the number of squares in a strip, and the multiplier the number of strips. It is generally used, however, only for showing that a rectangular area is numerically equal to the product of its dimensions; and generally only integral dimensions are considered.

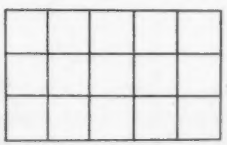

FIG. 2.—Multiplication of 5 by 3.

Even if we restrict ourselves to this simple diagram, and to integral factors, there are one or two important inferences to be drawn. To begin with, we may count our strips either vertically or horizontally; the height is the multiplicand in the first case, the base in the second; and the conclusion that a product is independent of the order of its

factors may be based upon something more real than a multiplication table. Again, we have here a test for prime numbers, as numbers that cannot be represented by a rectangle of squares. In applying

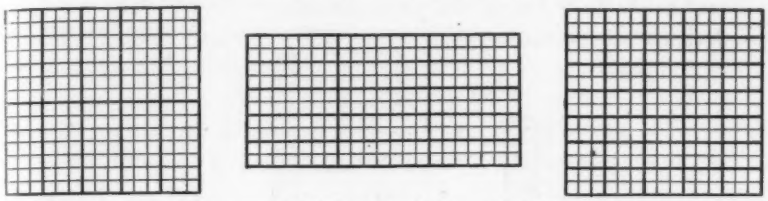

FIG. 3.—$2\times3\times7\times5=2\times7\times5\times3=7\times3\times2\times5$.

this test the pupil can easily be made to see that it is not necessary to try factors larger than the square root of the number he is trying to factor. The name "square root" need not be used—only the

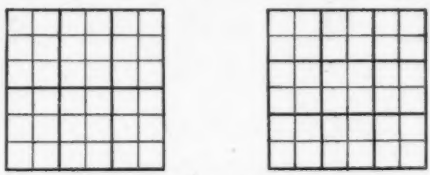

FIG. 4.—$3\times2\times2\times3=2^2\times3^2$.

trials need not be continued after the progressively increasing multiplier becomes greater than the decreasing multiplicand.

Continuous multiplication of several multipliers can be represented

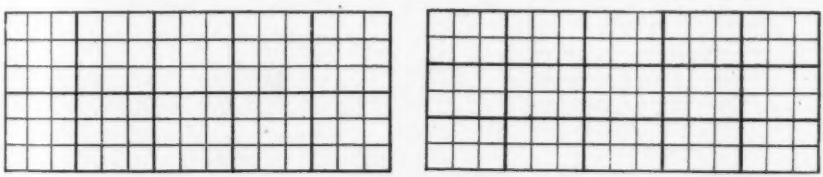

FIG. 5.—$2\times3\times3\times5=3^2\times2\times5$.

by an obvious extension of this diagram: a product of three factors by a row of rectangles, a product of four factors by a larger rectangle made up of equal rows of smaller rectangles, a product of five factors by a row of these larger rectangles, and so on. The commutative and associative laws can be illustrated by such diagrams.

When we come to the multiplication of fractions, our diagrams give us the best of definitions. Of course, the possibility of representing fractions is limited, but for halves, thirds, fifths, and tenths we may safely depend upon the pupil and his decimally divided cross-section paper.

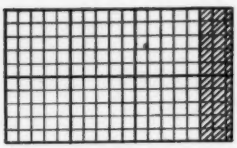

FIG. 6.—$2 \times 3\frac{1}{2}$.

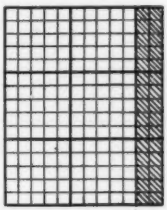

FIG. 7.—$2\frac{2}{5} \times 3$.

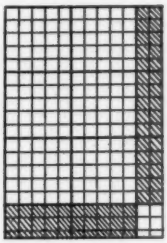

FIG. 8.—$2\frac{2}{5} \times 3\frac{1}{2}$.

$\frac{1}{2} \times \frac{1}{2}$. $\frac{1}{3} \times \frac{1}{2}$. $\frac{2}{3} \times \frac{1}{2}$. $\frac{1}{3} \times \frac{1}{3}$. $\frac{1}{5} \times \frac{1}{2}$. $\frac{2}{5} \times \frac{1}{2}$. $\frac{7}{10} \times \frac{3}{10}$.

FIG. 9.

The shaded areas in Figs. 6–8 inclusive show the products of the fractional part of one factor and the integral part of the other. Diagrams like those in Fig. 9 should be used to show that the product of two proper fractions is numerically less than either.

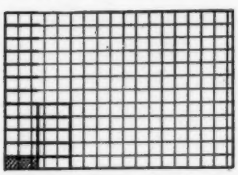

FIG. 10.—$2\frac{2}{5} \times 3\frac{1}{2} = \frac{1}{5} \times \frac{1}{2} \times 12 \times 7 = \frac{1}{10} \times 12 \times 7$.

In Fig. 10, the multiplication $2\frac{2}{5} \times 3\frac{1}{2}$ becomes $\frac{1}{5}^{2} \times \frac{7}{2}$; that is, taking the new fractional units, each of which is a rectangle, not a square, the base of the product-rectangle extends along a strip of seven of these units, and the altitude extends across twelve of these strips.

The practical application of this discussion is the carpet problem; and in younger classes the rectangles should habitually be plans of floors, or chalked-out areas on school pavements or platforms. Their unit squares would be square yards of carpet, specified as straw matting or ingrain, or whatever else comes in yard widths; or linoleum or pine boards, which are sold by the square foot.

In later work the brussels carpet, coming in three-quarter yard widths, gives a thorough-going illustration of the fractional divisor.

Pupils can measure and plat their floors, halls, and stairs at home, and draw a "scale of breadths" on tracing-paper, which may be laid over the floor plans to give by inspection the number of breadths—a check on their numerical calculation. If the floor plans are drawn on the ordinary scale, $\frac{1}{4}$ inch to one foot, the scale of breadths will be a set of parallel lines $\frac{3}{16}$ of an inch apart.

The practical restriction that, whatever the shape of the plan, the breadths must be bought with square ends is by no means worthless as mathematical discipline; neither is the restriction of matching patterns.

Besides this practical interest, the product-rectangle is of very great theoretical importance. Fig. 8, for example, serves to illustrate the binomial product $(x+a)\ (y+b)$, where $x=2$, $a=\frac{2}{5}$, $y=3$, $b=\frac{1}{2}$. An obvious extension of this representation is for the case where a and b are negative. Thus, in Fig. 11, when AB represents x, RB a, BC y, BR is measured back on BA, and the rectangle $BCQR$ is—ay, $ARQD$ being $(x-a)\ y$ and also $xy-ay$.

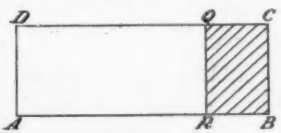

FIG. 11.—$y\ (x-a)$.

The product $(x-a)\ (y-b)$ requires a further complication of the diagram, and completes a set of diagrams which may be used in teaching the law of signs in multiplication. They do not, it is true, furnish an explanation of that law, and are not even of use as a mnemonic device; but they do furnish a parallel set of geometric facts with which the algebraic ideas can be associated.

When the study of formal geometry is begun the idea of the product-rectangle can be utilized, instead of rejected, in the proofs of the correspondence between areas and products, and the extension of these proofs to incommensurables.

Next after the product-rectangle in importance, and somewhat later in the pupils' development, comes the plane of analytic geometry, utilized for the representation of equations with two letters. Experience has abundantly shown that the diagrams described as follows have a very illuminating effect on pupils beginning elimination.

In beginning the study of simultaneous equations, the first thing to show is that an equation of condition with two unknown letters has

an unlimited number of solutions. A list of some of these solutions can be made by taking a succession of supposed values of one letter and finding the corresponding values of the other letter. Each pair of corresponding values forms one "answer" to the equation, and any diagram used to represent this answer must represent a value of x and at the same time a value of y. Such a diagram is formed by taking two algebraic scales and setting them perpendicular to each other with their zero points together. Call the horizontal line the x-scale,

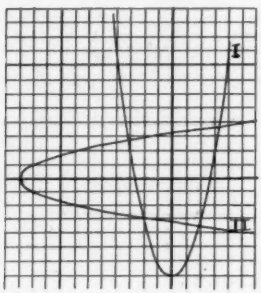

FIG. 12.—Diagram for Equations $x^2+y=7$; $x+y^2=11$.

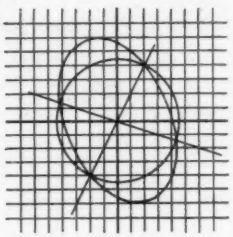

FIG. 13.—Diagram for Equations $x^2+y^2=20$; $bx^2+xy+y^2=32$.

or axis of x, and the vertical line the y-scale, or axis of y. Then imagine vertical lines drawn through all the points of the axis of x, and horizontal lines through all the points of the axis of y. A point representing any particular answer to this equation would be on the same vertical line as the value of x in the x-scale, and on the same horizontal line as the value of y in the y-scale.

Taking a partial list of the solutions of any equation of two letters, and marking the points which represent those answers, the pupil will recognize a shape in the diagram; can prophesy the location of a new answer, and verify his prophecy; and can be led to believe, although it may be beyond him to prove with rigor, that the completed shape indicated by his separate points furnishes a complete list of answers, an infinite list of answers, to one equation with two unknown letters; and that the accuracy of the answers obtained by him from that list depends only on his accuracy in drawing and measurement.

Elimination should be taught first for linear equations, plotting

each pair in a separate diagram, and pointing out that the answers give the co-ordinates of the intersection, as an answer which appears in both lists. After this fact has become familiar by the working out of several examples, and after the pupil has invented, upon slight suggestion, the plan of plotting only two points for each line, he should be cautioned that there are two-lettered equations that have curves for their lists of answers, and should plot two or three, substituting

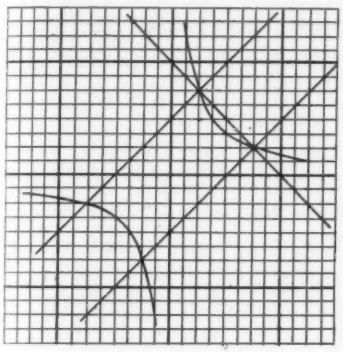

FIG. 14.—Diagram for $xy=12$; $x+y=8$.

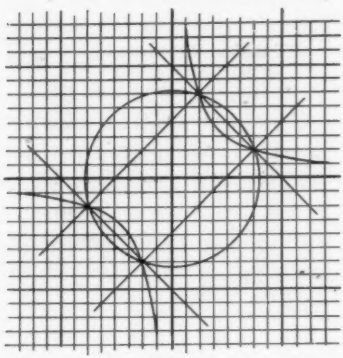

FIG. 15.—Diagram for $x^2+y^2=40$; $xy=12$.

successive integral values of one letter and solving the quadratic for the other. In this way he gets a diagram for the two solutions of a linear-quadratic pair, and for the four solutions of a pair of quadratics which he may be unable to solve algebraically. Thus for the equations $x^2+y=7$ and $x+y^2=11$, he gets a pair of parabolas intersecting in four points; and he can be taught to appreciate the argument that, since there are four answers, the equation that he gets by substitution will have four factors—a number which he cannot generally separate.

Another familiar type of simultaneous quadratics furnishes for a diagram a pair of central conics.

By combining these equations so as to eliminate the numerical terms we obtain the pair of straight lines $(2x-y)\ (x+3y)=0$, which pass through the intersections of the two given curves; and two of the answers are obtained by combining one of these linear equations with either of the given equations.

These diagrams show very clearly the way in which the different values of x and y belong together; and between what equations elimination can properly take place.

The method usually employed for eliminating when the simultaneous quadratics are symmetrical has quite an interesting diagram. The straight lines obtained in this method are pairs of parallels; and when both equations are quadratic the lines form a rectangle of which the corners are the answers.

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THE PLANS OF INSTRUCTION FOR THE GERMAN MIDDLE-CLASS SCHOOLS AND THE REGULATIONS OF THE GOVERNMENT.

In order to show how the results discussed in a former article of mine[1] are attained, I wish to publish the result of lessons in the different kinds of our middle-class schools, and the regulations of our government concerning the methods of teaching. I think it a matter of no small interest for my American colleagues to compare the number of lessons devoted weekly to the different branches of instruction and to weigh against each other the results attained in both our countries which today are looked upon as so prominent in school affairs. I have had some criticism on account of the article above mentioned, from some of my American friends who think that the amount of work devoted to some branches of instruction is not commensurate with the results obtained. I grant that there may be some truth in such a statement, but the greater part of what has been learned in a course of nine years' study cannot be shown in formal examination. Thousands of seeds that were strewn in the young hearts and brains do not show signs of growth during school time, but in later years they do yield a harvest; while, on the other hand, much of the knowledge crammed into the heads just for the sake of examination proves worthless in the trials of life. The case of Latin, Greek, and mathematics offers a very interesting illustration, with the overwhelming number of lessons during the year and the short space of time given to the oral examination, as well as the few papers set upon these subjects. The result is that, with all the great amount of work, only very few points can be brought up for examination, and if these points are not wisely chosen, the student suffers.

The following plans of study will illustrate the methods now in vogue in our country in the different kinds of secondary schools. I have noticed, in magazines and in books dealing with education in Germany, various ways of illustrating the actual working time-

[1] "The Examination of Maturity in the German *Gymnasium* and the *Real-Gymnasium*," SCHOOL REVIEW, November, 1903.

tables of our schools. These are more or less correct, but lack in some minor points in which a person visiting the country is likely to make mistakes. I have, therefore, tried in these plans to bring together all the information that can be very well demanded in a graphic description.

A. PLAN OF THE GYMNASIUM.

[1] VI	V	IV	U.[2] III	O. III	U. II	O. II	U. I	O. I	Total weekly	Total 9 years
Religion.....	3[3]	2	2	2	2	2	2	2	19	760
German,[4] and Tales from History.....	{ 3 4 / { 1	{ 2 2 / { 1 3	3	2	2	3	3	3	3	26	1,040
Latin.....	8	8	8	8	8	7	7	7	7	68	2,720
Greek.....	..	..	..	..	6	6	6	6	6	30	1,200
French.....	..	..	4	2	2	3	3	3	3	20	800
Hebrew or English[5].....	..	..	..	..	..	..	2	2	2		
History.....	..	..	2	2	2	2	3	3	3	17	680
Geography.....	2	2	2	1	1	1	..	..	..	9	360
Mathematics.....	4	4	4	3	3	4	4	4	4	34	1,360
Natural history (physics)..	2	2	2	2	2	2	2	2	2	18	720
Writing.....	2	2	..	..	..	..	..	..	..	4	160
Drawing.....	..	2	2	2	2	..[6]	..[6]	..[6]	..[6]	8	320
Gymnastics.....	3	3	3	3	3	3	3	3	3	27	1,080
Singing.....	2	2	..	..	..	..	..	..	..	4	160
Together weekly.....	30	30	32	27	33	33	33	33	33	284	11,360

B. PLAN OF REALGYMNASIUM.

VI	V	IV	U. III	O. III	U. II	O. II	U. I	O. I	Total weekly	Total 9 years
Religion.....	3	2	2	2	2	2	2	2	2	19	760
German and historical tales	4	3	3	3	3	3	3	3	3	28	1,120
Latin.....	8	8	7	5	5	4	4	4	4	49	1,960
French.....	..	..	5	4	4	4	4	4	4	29	1,160
English.....	..	..	..	3	3	3	3	3	3	18	720
History.....	..	..	2	2	2	2	3	3	3	17	680
Geography.....	2	2	2	2	1	..	..	..	..	9	360
Mathematics.....	4	4	4	5	5	5	5	5	5	42	1,680
Physics.....	2	2	2	2	2	4	5	5	5	29	1,160
Natural science writing....	2	2	..	..	..	..	..	..	..	4	160
Drawing.....	..	2	2	2	2	2	2	2	2	16	640
Singing.....	2	2	..	..	..	..	..	..	..	4	160
Gymnastics.....	3	3	3	3	3	3	3	3	3	27	1,080
Together.....	30	30	32	33	32	32	34	34	34	291	11,640

[1] The names of the classes are expressed in Latin words: *Sexta to Prima*(*?*). The three highest classes (*Tertia* to *Prima*) are dissolved into two courses of one year's duration each. Their names are Upper and Lower Third, Upper and Lower Second, and Upper and Lower First.

[2] U. III means *Unter-Tertia*, *i. e.*, Lower Third; O. III, *Ober-Tertia* = Upper Third.

[3] These numbers indicate the lessons given in each form.

[4] For the two lowest classes there is no regular instruction in history. Tales from history are told instead during the German lessons.

[5] By selection; optional.

[6] Optional.

C. PLAN OF THE OBERREALSCHULE.

	VI	V	IV	U. III	O. III	U. II	O. II	U. I	O. I	Total weekly	Total 9 years
Religion	3	2	2	2	2	2	2	2	2	19	760
German and Tales from History	5	4	4	3	3	3	4	4	4	34	1,360
French	6	6	6	6	6	5	4	4	4	47	1,880
English	..	..	..	5	4	4	4	4	4	25	1,000
History	..	..	3	2	2	2	3	3	3	18	720
Geography	2	2	2	2	2	1	1	1	1	14	560
Mathematics	5	5	6	6	5	5	5	5	5	47	1,880
Physics and natural science	2	2	2	2	4	6	6	6	6	36	1,440
Drawing	..	2	2	2	2	2	2	2	2	16	640
Writing	2	2	2	..	..	..	..	..	..	6	240
Gymnastics	3	3	3	3	3	3	3	3	3	27	1,080
Singing	2	2	..	..	..	..	..	..	..	4	160
Together	30	30	32	33	33	33	34	34	34	293	11,720

D. PLAN OF THE REALSCHULE.[1]

	VI	V	IV	III	II	I	Total, weekly	Total, 6 years
Religion	3	2	2	2	2	2	13	520
German and tales from history	6	5	5	5	4	4	29	1,160
French	6	6	6	5	4	4	31	1,240
English	..	..	..	5	4	4	13	520
History	..	..	3	2	2	2	9	360
Geography	2	2	2	2	2	2	12	480
Mathematics	4	4	5	5	5	5	28	1,120
Physics and natural science	2	2	2	2	5	5	18	720
Writing	2	2	2	..	..	..	6	240
Drawing	..	2	2	2	2	2	10	400
Gymnastics	3	3	3	3	3	3	18	720
Singing	2	2	..	..	..	..	4	160
Together	30	30	32	33	33	33	191	7,640

[1] This species of schools has on the whole the same plan of instruction as the Oberrealschule from the sixth form up to the lower second. But deviations as in the above-mentioned plan, are allowed.

Religion is, of course, the first subject upon the program, and we often wonder why it is that in America and in England it does not form part of the curriculum. We understand that in America the family or the clergyman of the parish is responsible for the religious life of the children, and the reason, we surmise, is that religious liberty is much greater than with us. I mean by that, the multiplicity of sects in America would demand such a large number of teachers in religion that it would be difficult to staff the school, not to speak of keeping order among them. Here only two religious branches are taken into consideration, the Protestants and Roman Catholics. If in some schools there are but few Catholics, there is no teacher of religion for them, but they are, of course, not forced

to take any part in the lessons in religion. In such cases religion is left to the family. Again, in parts where Roman Catholics predominate the Protestants must receive their religious instruction at home, and the same applies to Hebrew children. In what I shall have to say in regard to this subject, I shall deal first with the instruction of Protestants.

The general aim of religious instruction is to bring up the boys and girls in the fear of God, and, by explaining to them and teaching them the Holy Scriptures, to make them Christians who, by their religious convictions and their conduct in life, will exercise a wholesome influence upon the people. In the sixth form they are taught the tales from the old Testament, which are brought together in a reading-book. In addition to this, the first and third articles of faith, according to Luther's catechism, are explained to them and learned by heart, together with a small number of passages from the Bible, and four hymns.

In the fifth form (Quinta) the tales from the New Testament are taught in the same way. The second article of faith from the catechism is explained and learned by heart, and four new hymns, with a review of the work done in the sixth form.

In the fourth form the parts of the Bible and the order of the books in the Holy Scriptures are the subjects of instruction. Reading and explanation of passages from the Old and New Testaments follows, new hymns are learned, and the first three articles of faith are reviewed.

In the lower and upper third form Bible reading begins. The kingdom of God in the Old Testament and the New is shown by the reading and explanation of characteristic passages from the Bible. The fourth and fifth articles of faith are learned by heart, together with some Psalms and a few easy passages from the prophets. In the upper third the Sermon on the Mount is read, explained, and some of it is committed to memory. The history of the Reformation in Germany and the biography of Luther are also studied.

In the lower and upper second forms more difficult passages selected from the poetical and prophetical writers in the Old Testament are read and explained. The Sermon on the Mount is more thoroughly treated than in the third form. In the upper second the

explanation of the Acts of the Apostles is the chief subject of religious instruction, the lives of the apostles and other biblical persons being treated of, and some time is devoted to the history of the Christians of the later Roman Empire. The two higher forms study the history of the church; the development of the Roman Catholic church (Athanasius, and St. Augustine), the German missionaries, monasticism, scholastical and mystical movements, the Reformation, Pietists, rationalism, the union of the Protestant churches and the institution of the Protestant high church, the missionaries of the present day, and modern sects (Baptists, Methodists, etc.). The Gospel according to St. John and the epistles of the New Testament are explained, especially that of Paul to the Romans. An explanation of the Confession of Augustine, and instruction in morals and ethics, conclude the whole system.

It is very apparent that the regulations of the government are framed with an idea of bringing out clearly the ethical import of the teaching. The chief tenets of our faith represented in the articles are carefully taught, and the duties of a Christian made known to the pupils. In this system of religious instruction the Bible occupies the central place, and all other branches of instruction are treated as emanating from, and indeed leading to, it. As an introduction to the history of the church, we have the Acts of the Apostles, and in our church history we teach only the principal facts. These naturally consist of a sketch of primitive Christianity the victorious entrance of Christianity into the history of the world, the development of the church in the Middle Ages, the Reformation, and the development of the most important sects in modern times. In the *Gymnasium* the Greek Testament may be read, but the teacher must carefully avoid making a philological lesson out of a religious one.

The religious instruction for Roman Catholics has for its aim to acquaint the boys and girls with the doctrines and prescriptions, as well as the inner and outer life, of the church; to bring them up in the conviction of the truth and of the divine origin of Christianity in the church, and to profess this conviction by a life in and with Christ and his church, being always ready to confess this conviction.

In the sixth form the children are taught the necessary prayers and the catechism. They also read tales from the Old Testament

which, as in the case of the Protestants, are in a sort of reading-book. In the fifth form the second and third articles of the catechism are taught, treating of the holy commandments and the means of grace. They read new tales from the New Testament. In the fourth form the children are given the larger catechism, and there is a review of the Bible stories. In the lower third there is more study of the catechism, the explanation of the ecclesiastical year, and some Latin hymns and songs are learned by heart. In the upper third the study of the catechism is supplemented by the liturgy and a study of the holy sacraments. Church history begins in this form with characteristic biographies of noted men and women. In the lower second the general subject is what might be termed apologetics. The doctrines of natural religion, of divine revelation, of Judaism and Christianity, and of the sources of the Roman Catholic faith are taught the children. In the upper second the doctrine of God, creation, and salvation are treated, and the ecclesiastical history in biography is traced back to the time of Charlemagne. In the lower and upper first the dogmatical system is finished by the dogma of sanctity; particular attention is paid to the morals and to the endeavors of some people of the present time to undermine the holy doctrines of the church.

A certain degree of religious knowledge, faithful adherence to the church, and a firm conviction of the truth are the foundation upon which the religious building must be erected. The moral improvement so earnestly sought is furthered by the example of the teacher. A great many of the Roman Catholic pupils leave school after the lower second form is passed, and therefore it is the task of the teacher in this particular form to give the boys a short and yet comprehensive treatment of the Roman Catholic faith. The true moral life is held up to them as obedience toward the church which is a guardian of the divine doctrines, and in this faith there lies a particular charm against the movements of the present day which threaten to destroy all moral order and established faith.

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THE FUNCTION OF THE SCHOOL IN THE TRAINING OF APPRENTICES.

EMPLOYERS and employees in industrial pursuits are confronted by no more important question, at the present time, than that of the training of apprentices. The old form of an indentured apprenticeship has necessarily fallen into disuse, and in its place no uniform system or method has arisen. It was adapted to industrial conditions which no longer exist. The enlargement of the business unit, the increase of specialized methods, more extreme division of labor, the separation of the employer and the employee, and the growth of cities have so changed the organization of industry as to make a return to the old apprentice system impossible and undesirable.

A substitute must be devised which will give adequate training for our future shopmen and meet the requirements of modern shop practice. Labor leaders and employers generally recognize the necessity of special training and education for the future workers in the skilled trades and do not question the desirability of the end sought, but an agreement as to the best means for the accomplishment of the desired end, has not as yet been reached.

Apprenticeship is a form of education. Many young men learned their trades under skilled craftsmen in the days when each workman was an "all-round" man, when each man performed a variety of operations requiring much previous training. Today such conditions have vanished, the little shop is replaced by the large factory, and the worker, instead of producing an entire article, now makes only one small portion of it, or performs only one single operation upon it. As a result of this development of the large factory the education of skilled workers has become a difficult but important problem. At once we can agree that the factory is not well adapted to the training of apprentices; we look then to the school, which can co-operate with the shop and thus supply certain elements in the boy's training which the latter is unable to furnish under present conditions.

Great changes in industrial methods and practices make necessary correspondingly important modifications in the educational means

employed in the training of future workers. The school must adapt itself to the new situation and be prepared to take a new burden upon its already heavily laden shoulders. Our school curriculum has been greatly modified in recent years, by the changed home and industrial conditions of our people. Many new subjects have been added to meet a demand for training which no other institution was fitted to give; for example, natural science, manual training, domestic science, and physical training. These additions have increased the importance of the school, and have made it a more potent factor in the industrial and economic progress of this country. Nevertheless, after this enlargement and enrichment of the course, there seems to be a gap in our educational system not yet bridged over.

The curriculum is adapted to the boy who is not obliged to commence earning his living at an early age. If, however, he is obliged to go into the shop, the store, or the office, as soon as our compulsory-education laws permit, the benefits of free instruction are placed out of his reach except in a few isolated cases. In other words, the instruction given in the latter portion of the public-school course is accessible only to him who has sufficient funds to enable him to remain in school until the end of his eighteenth year. The boy who works must rely upon other facilities—the private night school or the correspondence school.

There are thousands of young men in our various correspondence and night schools who are receiving instruction in branches which are also found in the curriculum of the public school. This class of students ought to be reached through the agency of our schools. They know what they need, and are industrious, but the public school is not within their reach. By means of compulsory-education laws many unwilling children are forced to attend school. They are led triumphantly to drink of knowledge, while this great army of young men thirst for such instruction as will make them better artisans and better citizens.

It is frequently urged that these young workers, our future skilled artisans, desire trade and technical instruction; such training is called special education, a training for the few, and therefore should not be given a place in the public-school system which is supported by public taxation. An unprejudiced consideration of the case will, however,

reveal the fact that much of our present public-school instruction is really special, particularly that given in the high schools. It is especially valuable to one who wishes to become a lawyer, doctor, minister, or teacher, or who goes from the high school to the college. Even if this was not true, it can hardly be maintained that all taxpayers are not vitally interested in the industrial progress of this country. If it can be shown that the public-school system may do much to improve the knowledge, skill, and efficiency of our future workers, all the arguments which have been employed in regard to the support of schools by public taxation may also be used in this contention.

The schools are criticised on the ground that the teaching is not practical, and that the student entering a shop must unlearn much that has been taught him—a statement that has just enough truth in it to make it dangerous. A reason for such conditions is found in the separation in point of time of theory and practice. An abrupt and complete separation of school and business is not desirable, but at present can scarcely be avoided. The home, the shop, and the school ought to be brought closer together. If apprentices, and other young men, entering upon their life-work were given opportunity to carry on school work at the same time, as is done in Germany, we certainly should be nearer the solution of the apprenticeship question. Public night or half-day schools ought to be established in every city and town. The public school, on the one hand, and the shop, the store, or the office, on the other, should co-operate in bringing about this innovation. During the years of apprenticeship regular attendance in these schools should be required. The Brown & Sharpe Manufacturing Co. and the Baldwin Locomotive Works have well-organized apprenticeship systems, but both rely upon the assistance of private night or correspondence schools. Their apprentices are expected, and indeed, are required, to enrol in such schools.

The Baldwin Locomotive Works do not intend to give night instruction. They do intend to impart the technical knowledge. We depend upon the various night schools established throughout the city, and we pray for the establishment of more and better night schools, to give instruction for that portion of the training of the apprentices.

The best student is one who is working as well as studying—a desirable combination. There are many who are willing to subscribe

to the statement of a teacher: "No one who has ever taught a class of intelligent bread-winners will return willingly to academic teaching." A boy who is not diligent is frequently changed into a good student by taking him from school for a short period of time and placing him at work. He gets an insight into the affairs of the business world which teaches him that the school is an institution which can aid and benefit him.

Under present conditions, therefore, the school must be called upon to assist in the training of the skilled workers for our factories and machine shops. The influence of the school must be exerted toward aiding those young men who are actually engaged in earning their daily bread, but the hearty co-operation of employers, employees, and teachers is necessary. Education, not mere book learning, is the cure for many industrial evils. Much of the present labor trouble is due to the lack of proper educational facilities, and the absence of broader views and calm reasoning which are the logical results of such training.

The recent decrease in the number of hours worked per day will enable much to be done toward giving young workmen better educational facilities. Increased leisure should bring more culture and more rational means of enjoyment. Long hours of work are a sure preventive of educational and economic advancement of workers as a class. The apprenticeship question is of national importance, for our commercial and industrial supremacy depends upon a skilled body of workers, for which there is an ever-increasing demand.

The initiative should be taken by the employers and the trades unions. They realize more fully the necessity of the schools which this article advocates than our school authorities, and they are able to give valuable suggestions as to the character and quality of the training which should be given. The ordinary night school does not meet the requirements; its work is too desultory and fragmentary, and there is usually little co-ordination with the daily work of the student. The one agency which can properly meet the demand is the public-school system.

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THE EXTENSION OF THE HIGH-SCHOOL COURSE.

I WISH to urge the claims of a possible and eminently practical solution of the problem of the correlation of secondary with other types of instruction. The plan submitted is, of course, not original, and it is not new, either in theory or in practice. In the discussion of any proposed reform it is well to bear in mind that human wisdom can hope to achieve nothing perfect. Rational reform is purely a question how to get more of the better with less of the worse. The world moves, and we must move with it. We cannot afford to pin our faith to the coward motto: "Let good enough alone." The law of progress is on our side only when we are on the alert for better things, when we note and take to heart the lessons of experience elsewhere, and when we take our bearings from high ground. To live and strive in this law is peculiarly the debt which the teaching profession owes to civilization.

Fundamentally, instruction divides itself into four types: elementary, secondary, advanced, and special. The first three, which are general, it is necessary to characterize. Their functions, in the main, may be differentiated as the acquirement of the common rudiments for the elementary, the attainment of fuller knowledge and training for the secondary, and research and productive scholarship for the advanced instruction. These functions are not at all mutually exclusive, and differ in degree rather than in kind; for all teachers, of whatever type, are caretakers and sharers in the complete purpose of education—the development of the physical, intellectual, and moral powers, together with an insight and ultimate disposition to fructify them in the interests of what is worthy in the self and in humanity.

The pupil leaves the common school at the critical age when his interests are unsettled, his powers of insight nascent, and he is just beginning to grasp the larger relations in his life's world, unable wisely to adjust himself to some sphere of action in it. To provide education for able youth, in consequence of which life may be lived on a larger and higher plane, with more enlightenment, and with greater

command over opportunities, and for the betterment of society, high schools exist. The aim of secondary instruction may be particularized as follows: an elementary knowledge of the facts, truths, and laws of relation in the domains of science, history, government, and literature; a fuller development of loyalty to the bettering influences, culminating in due time in seriousness of purpose; last and most important, depth of insight, sanity of judgment, and the power of adapting means to ends—the last a quality singularly unrecognized and neglected. "Knowledge is power" only when it is the possession of a trained intellect. The conditions for the training in these essentials are at a white heat in the adolescent period, for it is the period when assimilation by memory is supplemented by a rapidly growing power of the understanding, and when interest is most in the ascendant.

During the period of secondary, as well as of elementary, instruction the purpose should be general rather than special. There is a tendency, however, in our high schools to permit scholars to select work along the lines of aptitudes. To most pupils studies along the lines of least resistance are the most flattering, and therefore the most interesting. Electives should not only be controlled, but largely discouraged. In the main, courses only should be elective, and these alike hard and broad. There are culture-epochs in the history of the human race, and it is well known that these epochs tend to repeat themselves in the growth of the mind. In a normally constituted child one interest develops into another. They are legitimate, and at their white heat the most should be made of them. But no mental bias should be established prematurely, else the mind becomes narrow and stunted. Difficulties must be met and overcome, and weaknesses trained into strength. For more reasons than one the hard study is most necessary and beneficial. It is a spiritual just as much as a physical law that without resistance there can be no increase of potential. Eclecticism in studies for the mentally undeveloped seems to be founded in a theory more plausible than sound.

Moreover, studies in secondary schools must be directed for the training they afford and the insight they give into the realities in life, and not because they lead to colleges. Unless this view is kept steadfastly in mind, high schools and academies easily degenerate

into institutions of preparatory cramming. It must, however, be conceded that the preparatory purpose comes in as a strong second-best, for in every high school there are at least a few bright enough and deep enough to continue their work. By the time the secondary course is completed the student has had a chance to discover his forte to some extent. For him the professional schools exist, to equip him for any particular calling, or the university with its training for larger opportunities in any chosen field of work.

Now, unfortunately for our higher education in this country, very much of the secondary work is still, and for a long time must be, continued in the university. Both high schools and universities are in a state of transition. Consider that the high schools of today are modeled much after the academies preparatory to the old-time college, that the old-time college taught practically nothing but secondary branches, and that only recently has there been manifest a trend toward advanced education. The number of institutions in America doing much like real university work can be counted almost on the fingers of one hand. It is a far cry from our best to the European centers of learning with their research and productive scholarship. Our universities are continually increasing their requirements for admission, in the hope of having the lower schools do much of the secondary work by which they are handicapped. The demand is right, and it is timely, if we are to progress to the fulness of our promise. This country of ours is new with splendid potentialities undeveloped. From crude bigness in population, in miles of railroad, and in the unparalleled production of wealth, we wish to rise to real greatness in things intellectual.

But how are the lower schools to do more with their already crowded courses? The only possible remedy would seem to lie in the extension of the high-school curriculum. Ultimately, and before many years, the extension must be upward to include much, if not all, of the secondary branches now covered in the colleges. The University of California, because of its overcrowded condition, sees no other practical solution, and the committee of the faculty in charge of the recent revision in entrance requirements seriously discussed the future advisability of having the high schools do most of the work now done in the first two years at the colleges. It is held,

moreover, that in the high schools with their smaller classes, and hence more individual attention, the secondary studies can be carried more thoroughly and satisfactorily than is possible at the university. It is not, however, my purpose to advocate an upward extension of the high-school courses, but to contend for a necessary economical, and harmonious readjustment between the secondary and the elementary schools.

The American high school has been brought practically to the door of every home, and the time-worn argument of injustice to taxpayers is shelved. Strangely enough, the most expressed and latent opposition to high-school progress seems to come from educators interested more directly in the work of elementary schools. Many would have it that education should be democratic, and that the demands of higher education are on this account somewhat open to disparagement; that it is not so much necessary to supplement the advantages of pupils already strong, but to apply the main stress of instruction for the benefit of those not so favored. Genius, it is said, will find its own high level of efficiency, and the strong are already too much alive to the main chance. These objectors would make our educational system conform mainly to the needs of the mediocre majority. The same philosophy is made to apply to class work. Anybody, it is alleged, can teach bright scholars. They teach themselves. The good teacher is measured by the ability to make a good showing with poor material. There is a large measure of truth in this position. But if, in consequence of accommodating the quality and the quantity of instruction to the duller average, the strong pupil is undertrained of his full measure of power, may it not be argued with even more justice that the state is defrauded of its highest hope? I believe it is so. It is the strong pupils who become our leaders in all the walks of life, from the professions down to the humblest callings—our rulers, our ministers, editors and educators, our captains of industry, and the embellishers of every community. It is through them our work as teachers becomes most beneficent to society. Instruction and educational systems are in the interests of the bright children first, and need not militate against the weak. Nature herself gives us our cue, for she always favors the strong in the race; but, unlike nature, let us help also the less favored, and

as teachers be merciful to their best endeavors. To democratize education is to predestine the failure of democracy. It is its aristocracy that contributes most to the progress of any nation—aristocracy not of wealth nor of blood, but of ability, influence, and character. It is the leaven that permeates, moves, and uplifts the mass, and yet is not distinguishable from it. The state, therefore, owes it to itself to provide adequate higher instruction for its best citizens. Saint-Simon's formula in economics for the just distribution of opportunity ought to hold in education: "To each according to his capacity, to each capacity according to its work."

It is possible to organize a system of instruction so that the three types shall be independent, the lower of the higher, and yet so co-ordinated that a scholar may pass from the elementary school through the university, or drop out at any point, and get the best training, up to that point, he is capable of with the least waste of time and effort. This co-ordination of sequence should be recognized as the prerequisite in any system which seeks completeness and economy. As matters now are, the gradual and natural transition through all the grades is impossible. Furthermore, our whole system seems to be vitiated by two cardinal vices—undertraining and oversmattering. There is a confused and confusing effort to cram into the growing mind an assortment of encyclopedic knowledge of everything which for private and state reasons is held to be worth knowing. The result is somewhat like a picture which is a hodgepodge of miscellaneous impressions out of focus, with no fundamental lines expressing unity, proportion or perspective. A bungling application of the principles of co-ordination and correlation along the lines of apperception is expected to render digestible all the stuff crammed into the overloaded brain, and the success with which the brighter hopefuls memorize and reproduce literally the lessons is to the teacher a self-flattering gauge of the assimilation of the ideas and the potentialities of the particular study.

After eight years in the elementary schools our pupils enter upon the high-school course. The methods in vogue in the two kinds of schools are necessarily at variance, and so the transition is abrupt and violent. Worst of all, the pupils are sadly deficient in the power of application. Yet the course must be covered in not more than

four years. As a result the classes are jammed through the studies. The sciences, mathematics, and history are literally bolted, and the training would be comparable with that in spelling if in the grammar schools that subject were shelved after a year's drill.

To illustrate how inadequate our secondary course is, I shall attempt in the light of educational values to point out what ought to be accomplished in certain lines.

High schools are supposed to teach what are called the lesser mathematics. As a matter of fact, an almost pitiful minimum is required—algebra through quadratics, and plane geometry. Solid geometry, plane trigonometry, and advanced algebra are added in a small minority of schools. Of co-ordinate geometry, whose elements are easier and its principles of infinitely more importance than advanced algebra, one hears nothing. The whole subject, as far as the ground is covered, is divided and treated separately under different aspects, each of which gets a short monopoly of attention, is jammed and crammed, and then shelved. Now, the rational, economical, and really effective way is to present mathematics as one subject, to distribute the work through year after year, and gradatim, so that with long contact the insight into mathematical relations and the power of thinking may grow with the mind as it develops toward maturity. Algebra and geometry, and trigonometry as soon as may be, should be taught together and continually co-ordinated by means of the Cartesian geometry. There are beginnings of this method in America, and it has long been almost universally in vogue in Europe. Professor Young, of the University of Chicago, who has recently spent a year in Prussia to observe high-school methods in the teaching of mathematics, found that the Prussian schools cover all the lesser mathematics, including calculus, in four-sevenths of the time we require to cover the same ground, and with results at least as good as the very best accomplished in this country.

High schools are expected to carry natural science pretty effectively. In California all our students are required to study physics as the most practical and the most fundamental branch. A small portion of them have an opportunity for studying chemistry—and the proportion who add botany and zoölogy to their attainments is very small. To develop insight into the relations existing in the

concrete world is a function peculiar to science-training, and is hence most conducive to material progress. The most essential quality of genius, as has been well pointed out, consists in the extraordinary power of seeing new relations. It is this high capacity of the intellect, joined with a dominant will to achieve, which, in any sphere of activity, originates the very elements of progress. If it is in the power of any line of study more than any other to arouse, discipline, and fructify the capabilities of genius, and particularly along the more utilitarian lines, that study is science. But science-training, training that is more than science cramming, cannot be attained in the small time allotted in our present courses. Just now we hear much about another study that some educators would have made an optional substitute for physics. It is called a course in general science, and should embrace the fundamentals of the four sciences, already mentioned, and include much of the derived sciences, such as physical geography, meteorology, geology, and astronomy. Such a course is much needed, and should develop a broad and intelligent understanding of the dynamics of nature. It ought not, however, to be given as a substitute for physics, but always added to it, and later in the course, as an unconditional requirement.

Perhaps even more important than the sciences, from the standpoint of culture, are the so-called humanitarian studies. A knowledge of history broadens the sentiments and emancipates from narrowness. Ultimately it should ripen into an understanding of social movements and of human nature in the large. The history of our own country and civics should be a fitting climax. Now, the time required to cover the ground with anything like elementary adequacy is one year for ancient history, one year for mediæval and modern history, which ought imperatively to be followed by a year in English history, and lastly, one year in American history—four years in all. Yet, as matters now stand, students usually get but two years in the high school, and too commonly go through college without completing the subject of general history at all.

A high-school course should include the study of at least two foreign languages. They open vast resources of literature and of information not otherwise available. The training qualities inherent in language study are commonly underestimated, and all too com-

monly by language teachers themselves. To render the thoughts of the foreign masters into equivalent and idiomatic English calls forth powers of self-expression more original and of a higher order than obtains in most composition work. It is certainly true that classic students excel in adequate and finished expression. At least a good reading knowledge at sight should be acquired, and a high premium should be placed on the ability to speak the modern languages. The Germans put it well: "A man becomes twice a man when he learns to think in another language." But for purely cultural purposes, Latin and Greek are entitled to the primacy. They contain the most perfect models of literature. As inflectional languages they have greater training power, and they have furnished to our English a multitude of root-words. Our scientific vocabularies are entirely derived from them. A knowledge of the classic tongues, therefore, promotes an understanding of our mother-speech as does no other. Latin especially should be pursued as an indispensable condition for sound learning. The time available for any modern tongue is entirely too short, and in the long run the result amounts to little else than a forgotten smattering. In passing, I wish to drive home one point. We begin our linguistic study too late. The sooner after the age of ten the better. It is the age when the language faculty is still nascent, and word-assimilation is still at its best. Why Americans as a rule are inferior linguists no doubt finds its explanation in deferring the study too long.

Time forbids to touch upon the needs of other departments of secondary work—of the paramount worth of English, whose worth, however, is pretty well recognized; of manual training, whose claims are not so generally acknowledged, that is, training in the use of tools, not for the mere learning of a handicraft, but to render the hand ready and skilful in giving form to the mind's contrivings, in short, hand-and-brain correlation—a subject so important, so full of possibilities and many-sided bearings, practical, æsthetic, and even ethical, as to demand a separate treatment.

Now, for entering successfully upon a course of secondary instruction, how much elementary instruction is needed? For all the purposes of the high school, the essential test consists in the ability to read easily and understandingly, and to have a taste for reading;

to write legibly and to compose thought in clear and simple English; a fair ability for quantitative reasoning as applied to very ordinary problems, accuracy in performing the fundamental operations, and the correct expression of mathematical relations by means of symbols; perhaps enough of the simple elements of grammar to begin the study of a foreign tongue; above all, a fair power of application. Other attainments may be presupposed or taken for granted. These prerequisites would seem moderate, and eight long years a prodigious length of time to effect them. Our elementary instruction is said to lag two years behind that in European countries. Nevertheless, there is found in our entering students a serious lack of drill. Reading is too often neglected because of other requirements. High-school teachers are known almost everywhere in California to give much extra time to drill in the spelling of the commonest words. Even the most juvenile composition is frightfully defective. In arithmetic we have no very serious drawbacks to record, excepting very careless notation. But when we come to grammar, there is something radically wrong. Everywhere in the high schools, both in the cities and in the country, it is necessary for teachers of English and Latin to waste weeks and months to drill in the simplest essentials. I believe the indictment lies against the text-books used. The principles of grammar are simple enough. But hairsplitting grammarians with too little equipment have tinkered with terms, differentiated, complicated, befangled with diagrams, and alto gether so exalted the trivial to the confusion of the essential as to make the ordinary English grammar text almost a joke and a thing of scorn to the philologist.

But why teach technical grammar at all in the common schools? To teach correct English expression? Correct expression is almost entirely the result of habitual usage. As well expect a principle of geometry to guide the saw of the carpenter as to expect the correct use in the pronouns "I" and "me," or in "as" and "like," from the conning of a rule. Now, there is a place for technical grammar, and in many states it is given in the high school, where it belongs.

I am drawing to the inevitable conclusion, for I have purposely kept the final proposition in abeyance. There is a simple and effective remedy for these our ills of adjustment. The movement for its

incorporation into our school system has been on foot for some time; mention of it has been made in behalf of California; it has the warm approval of many educators; its operation is actually under way in one or two of the older states; it has for generations been the established practice in most of the countries of Europe. In conclusion I shall urge additional reasons for its early introduction into our own country, and into California in particular.

The plan is neither more nor less than to leave the grammar schools pretty much as they are, with their eight or nine grades for pupils whose schooling ceases with elementary work, but to require pupils who are to take up secondary work to enter the high schools at an earlier age, and to increase the length of the high-school course to at least six years.

Upon consideration it will be found that the lines of transition from the elementary to the secondary instruction naturally have their point of departure at the end of the sixth grade.

The sequence of studies can be made more logical, can be made to cover more ground, and with less stress, less waste of time in the life of the scholar, more adaptable to his state of development.

It is evident that with a longer secondary course the violent and sudden stress bearing hard on a large proportion of new students could be much mitigated, since the amount of work could then be made commensurate with their immature but growing powers of attainment.

It must be apparent, too, that the bright pupils in the elementary schools do not acquire an effective power of application by doing the tasks meted out to suit the average capacity of the class. In the high school, on the other hand, the average of ability is obviously much nearer their measure. In the upper grades pupils do not get out of their work anything like the interest, absorption, and results commensurate with their strength, and the fault lies chiefly in doing a kind of work that does not appeal to serious effort. Consequently scholars get into the pernicious habit of dawdling away their precious time, and become undertrained in the power of application.

The pupils would get the advantage of coming two years earlier under the care of teachers who are teaching their fortes. For high-school work the universities of this state recommend only teachers

with special equipment and pedagogical training in the line of the specialty.

For pupils who are to pursue the secondary mathematics the time now given to arithmetic in the grades involves a prodigious amount of work that comes near being misdirection. Why take up hours, hundredfold in the aggregate, working problems by headbreaking analysis for which the algebraic equation offers an easy solution? Why at all do any kind of work that the pupil will cover in the high school—mensuration, for instance—or why force under conditions of immaturity a faculty for whose fuller development subsequent instruction provides? We are often deceived in the supposed discipline pupils are thought to get from arithmetic. Scholars are frequently able to solve every problem in the book, not because they clearly apprehend the relations of the given quantities, but because they can relegate the example to a remembered process, or paradigm, of solution, but are "floored" by a simple problem they fail to associate with a formula of operation.

With no more grammar drill than is covered in connection with composition work before the close of the sixth grade, pupils ought in the high school to learn all the essentials of grammar in a few months at the most, preferably under the instruction of the teacher of Latin, and should be contributory to the study of Latin to follow it immediately, or go with it. In deference to the possible objection that a pupil cannot learn English grammar by the study of Latin, it is only necessary to state that the study of any language must begin with that of its grammar, and in all Aryan tongues the principles of expression are alike. The parts of speech are the same, and even many of the principles of syntax. Expression is governed everywhere by the same natural conditions of person, number, case, time, mode, etc.

Languages, in the main, differ not in principles, but in vocabularies and idioms. It is only in the study of another tongue that the student is enabled clearly to distinguish between what is a general principle and what is an idiomatic construction—a very good reason why the study should be deferred to the high school. It is a common remark of our scholars that they never understood grammar until they took up Latin. What is this but an exemplification of the true saying that no one knows his own language well who does not know any other?

Again, why should a common-school pupil need to study United States history and civil government, when these are prescribed in the high-school course as an absolute requirement, as is the case in this state? The elementary work should consist rather in reading and class work of short and interesting biographies in chronological sequence of the makers of American history, from Columbus down to Roosevelt. Children are apt to become hero-worshipers. Into these biographies could be woven incidentally as many historical facts as desirable. Continuing this plan in the high school, the great personages in the world's history could be taken up in much the same manner, and thus a good foundation be laid for the subsequent study of history proper, culminating in United States history and civics, as before indicated. And is not this also the rational order? He understands his country's history best who knows the world's history most. American history begins, not with the discovery by Columbus, but away back in the civilization of Egypt, and the American constitution is the lineal and unbroken descendant of representative government among the Saxons ages before the coming of Julius Cæsar. In fact, the most wholesome lesson of history is the continuity of principles and of institutions, and a perception of this truth should make for rational and intelligent conservatism.

Of necessity, the extension of the secondary course would cause an increase in educational expenditure, but the increased cost would be as nothing compared with the benefits. A thing of such paramount importance as progress is worth its cost manifold, and when the utility of an institution has become manifest, the public is not behindhand to foot the expense. The proportion of the class who patronize the high schools is rapidly growing in this country. California has over one hundred and sixty high schools, not over ten of which are county schools, all the rest being of the city, district, or union type. Over 99 per cent. of the pupils are enabled to attend daily from their homes. It is very apparent that the proposed lengthening of the high-school course can involve scarcely any additional expense or hardship to the patrons.

It would be pertinent to this discussion to show also how foreign countries have solved this problem. Suffice it to say that in no European state about which information is available are pupils admitted into secondary schools at so late an age as with us. The

usual age seems to be from nine to eleven, It is true of the English preparatory schools, of the *lycées* of France with their long courses of eight years, of Spain, of Portugal, and particularly of the German scientific schools with their six-year courses, and of the *Gymnasia* with their nine-year curricula leading to the universities. It will never do to answer that we are sufficient unto ourselves, we need learn nothing from other lands with their "peculiar institutions." After all, human progress is everywhere governed by the same physical and spiritual laws, and everywhere humanity has to work out its salvation in much the same way. In many things we are far too self-sufficient and unwilling to learn from other people. We have inventors, manufacturing enterprises highly capitalized, and, above all, educators, who are groping for light on problems solved long ago by compeers of other nationalities. Other nations seem to evince no such dislike to learn from us, and profit by so doing often to our cost. The American profession of medicine mutually shares in the achievements the world over. The teaching profession can least afford to be provincial. Rather than object, as objection is frequently made, that Europe, with its aristocracy and caste system, needs secondary schools of a highly developed type—a type not in consonance with our institutional ideals—is it not more in accord with our national aspirations to demand a highly developed type of our own? Because of our democratic composition and consequent leveling tendencies, we, of all peoples, have need of a real aristocracy of influence and ability to infuse into our national life a greater stability and the elements of progression, and hence must perfect an educational system affording instruction, not only to all the masses, but to our abler citizens adequate opportunities for the degree of industrial, intellectual, and moral achievement of which they are capable. In competing with the world for honors of whatever kind, America cannot afford to be handicapped by a wasteful and disjointed arrangement of instruction founded on obsolescent conditions. The primacy in progress, even progress that is estimated in dollars, will be owned, not by the nation that builds chiefly on natural resources, but by the nation which draws its strength from the most adequate and scientific system of education.

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FIRST-YEAR LATIN.

DURING the last few years much has been said in regard to the teaching of first-year Latin. The place that it has held on the programs of educational meetings, the many articles that have appeared on the subject, and the numerous first year Latin books recently published seem to indicate that the methods now in vogue are in a measure unsatisfactory and that a better way is being sought. It is conceded that the first year of the Latin course is far the most important, as the defects noticeable during the remaining three years usually are directly due to the fact that the first year's work has not been thoroughly mastered.

In order to understand the exact measure of our deficiency, we should have a definite idea of the end to be attained. Whatever benefits are incidentally derived from the study of Latin, the main object must always be the ability to read Latin with pleasure and appreciation. How well this is accomplished in the high school can best be learned from the high-school graduate himself. Does he wish to continue the reading of Latin as a pleasurable occupation after his graduation? If he should so desire, has he, after four years of study, a mastery of the language sufficient to enable him to continue it by himself with pleasure and profit? We must admit that few indeed have either the desire or the ability. At the end of four years the average high-school graduate reads Latin only laboriously with constant reference to the lexicon; the effort required to arrive at the meaning too often preventing the pleasure that should be derived from the contents and the beauties of the literature. Cæsar, Cicero, and Vergil, each in turn, have been toiled through with infinite pains. Even in the third and fourth years the pupil is often nearly helpless without the grammar on the one hand and the lexicon on the other. Both these always have an important function, but their legitimate use at this stage, and indeed at any stage, is not the consulting of paradigms and rules that should have been learned, nor the looking up of words already encountered many times. The inability of the average high-school graduate to read Latin with the readiness that

would enable him to derive the desired pleasure and profit from the literature must be acknowledged. The cause of this inability lies in the first year's work.

The pupil usually finds the first year of the study of Latin a period of sore tribulation, if not of tears. The universal testimony shows that Latin is the most difficult study in the first year of the high-school course. That Latin is difficult cannot be denied, and unfortunately it cannot be remedied. Whatever method is employed in the teaching, it is and must always be a difficult language. Nor is the experience of the child in the lower grades usually such as to prepare him to cope successfully with an exceptionally difficult study. Accustomed as he is to the careful supervision, the short lessons, the much drill on each new point, the frequent and thorough reviews of intermediate and grammar grades, he comes to the high school, where amid widely different methods of study and discipline he is expected in nine or ten months to master a vocabulary of two or three hundred foreign words, and to accustom himself to the strange fantasies of a much-inflected language, where each noun has many different forms, each with its own peculiar significance in the sentence; where the same ending may mean different things in different words, and in the same word in different sentences; where the same meaning is expressed by different endings in different words; where adjectives vary their form according to the word with which they are used; where voice, mode, tense, person, and number of verbs are indicated by a bewildering variety of modifications and terminations. All these various forms must be so thoroughly learned that he cannot only recognize and interpret them at a glance, but use them correctly. Add to this the difficulties of Latin syntax, whose many unusual and idiomatic constructions must be thoroughly mastered, and we have a colossal task indeed for children who have found it not easy to master in four or five years the incomparably simpler English grammar! Furthermore, all this formidable array of difficulties is presented so rapidly as to violate the most fundamental principles of pedagogy and common-sense. And Latin is only one of four subjects in the first year of the high-school course! It is no wonder that many children become discouraged and wish to drop the Latin. It is no wonder that they go down by platoons before a searching fire of ques-

tions that expects them to learn more new things in one study in one year than they have probably learned in any one year in all the studies of the curriculum put together. The only wonder is that more do not fail.

The fittest who survive this ordeal of the first-year work are necessarily many of them in various stages of bewilderment and confusion. The best of them are hardly in a condition to enjoy and appreciate the classics. They can and do read them, if that by courtesy can be called reading which consists in laboriously puzzling through a sentence word by word, with one finger between the leaves of the vocabulary, another at the notes, and a grammar open with marks conveniently placed at paradigms and rules; if those can be said to read the classics, who stop with the complaint, "I cannot get those words in," or "I translated it last night, but I have forgotten how I had it!" This is not the pupil's fault, nor is it the fault of the teacher. It is due to a system that requires the child to attempt the impossible, the complete mastery of what is known as first-year Latin in one year or less. A system that compels him to undertake to read Cæsar before it has been possible for him thoroughly to learn, digest, and assimilate a mass of mental pabulum that he has been compelled to swallow in a few short months. It is no wonder if mental indigestion follows such an outrage upon nature's laws. We have a way of explaining the fact that so large a proportion of those who begin Latin fail to pass the first year's work by saying that "some children cannot learn Latin," or that they are "poorly prepared in English grammar," when the fact is that they do not have the opportunity to show whether they can learn a reasonable amount of Latin in a reasonable time.

Latin can be taught in such a way that it shall cease to be a bugbear. Make two or three roses of different sizes and colors the subject of the first lesson, with the help of these the pupils from easy Latin sentences will readily discover for themselves the meaning of the Latin words, *rosa*, *magna*, *pulchra*, *alba*, *non*, *est*, *ubi*, etc. They will be delighted to find that at the end of the first lesson they can themselves ask and answer questions in Latin. Nor will their enthusiasm abate as by easy steps plurals, agreement of adjective and verb, and different case forms are introduced. Even the dull

pupils will give sentences of their own with fair accuracy and unflagging interest. But this is slow work, and the iron hand of the educational system is heavy. At this rate it will be impossible in thirty or forty weeks to cover the required ground. We must hasten, new forms must be introduced before the old are thoroughly familiar, new words before the old are well learned, new constructions before the old are so thoroughly understood as to be used readily and accurately. Difficulties multiply and again we are struggling in the same old familiar slough of despond.

While it is possible to teach Latin in such a way that even the dullards will learn much, that all will enjoy it, and that no larger a proportion will fail than in other studies, yet it seems impossible to do this and prepare the average pupil in one year to read Cæsar with pleasure and appreciation. As well expect children in interior China, who have never heard a word of English outside the classroom, and who are absolutely ignorant of our customs and civilization, to prepare themselves in one year to read with appreciation Macaulay's *History*, then Burke's speeches, then *Paradise Lost!* Granting that with the aid of dictionary and grammar they can plod through them at the rate of ten or fifteen lines a day (increased perhaps to fifty lines the fourth year), what appreciation will they have of these masterpieces of literature? There are teachers who begin the study of Latin with the first sentence of Cæsar's *Gallic War*. Fancy introducing our little Chinese boys to English by showing them the first sentence in Macaulay's *History!* In Germany the boys study Latin three or four years before beginning Cæsar, with the result that they can really read and enjoy the classics. If the only object of the study of Latin is to drag the hapless child through a certain amount of classical Latin in the shortest possible time, then perhaps the sooner the process is begun the better. But if the object is to develop the power to understand and enjoy in the original the beauties and the truths of classical literature, then surely the first steps must be simple and natural, and as carefully graded and thoroughly learned as the first steps in arithmetic or English grammar. There should be much reading of easy Latin, not a few sentences illustrative of each grammatical principle, but many simple stories and descriptions through the medium of which the grammati-

cal principles may be so gradually introduced as to be thoroughly assimilated and made the pupil's own.

There is at present a notable lack of such material available in this country, but surely we have men wise enough to furnish it for us as it has been furnished in Germany. There is also an old-fashioned prejudice against any Latin not strictly classical, regardless of the fact that Latin authors wrote for mature minds, never for children. Is it not a little absurd to fear that the omnivorous little readers who have free rein in our public libraries, and who often eagerly devour story books scarcely "classical" at the rate of two or three a week, may perhaps have their literary taste corrupted by stories written in Latin by learned men? Granting that the modern Latin lacks somewhat the classical flavor, may it not be less of an evil for beginners than classical Latin much too difficult for them?

Latin is a hard language, and natural laws teach us that the only way to accomplish a difficult task well and without injurious fatigue is by easy stages. But unfortunately that is the one thing we are not allowed to do with Latin in our high schools. The continually increasing demands of college requirements, which must be met by the high school, leaves us no choice in the matter. To prepare for college in four years the children must begin to read Cæsar or Latin of equal difficulty at the end of the first year or earlier. The high school cannot easily increase its course to five years. In many schools it hardly seems practicable to begin Latin in the grammar grades. The stern logic of events seems then to make it necessary to crowd more and more work into the four years. The satisfactory solution of the problem of first-year Latin would necessitate changes so far-reaching that it must be left to wiser heads than mine. In the meantime, the fact remains that the child's capacity is not so elastic as is the classical curriculum, and the process of accommodating him to the increasing demands is difficult, alike for teacher and pupil.

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RECENT EDUCATIONAL BIBLIOGRAPHY.

VII.

THIS is the seventh annual list of bibliographies of educational topics. The first six articles have appeared in each October number of the SCHOOL REVIEW from 1898 to date. The following items for 1904 seem to merit mention here:

CHILD-STUDY.

"Bibliography of Child-Study for the Year 1902." By L. N. WILSON. (In *Pedagogical Seminary*, December, 1903 [Vol. X], pp. 514–36.)

This is the sixth of Mr. Wilson's useful annual summaries. There seems to be no diminution in the amount of child-study literature that a diligent bibliographer can discover.

CO-EDUCATION.

La co-éducation des sexes: étude sur l'éducation supérieure des femmes aux États-Unis. By F. T. MEYLAN. Bonn, 1904. Pp. 181, 8vo.

Contains a poorly arranged five-page list of authorities.

EDUCATION.

Educational Review. Edited by NICHOLAS MURRAY BUTLER. "Analytical Index to Vols. I–XXV." By C. A. NELSON. New York, 1904. Pp. 218, 8vo.

The first twenty-five volumes of the *Educational Review* form a veritable cyclopedia of educational topics and events for the past twelve years of unparalleled educational growth and activity. They have here been minutely indexed with the fidelity and intelligence of a practiced workman. This index will greatly increase the reference value of any set of the *Review*, and will be of value also to all students of, or writers on, educational topics, as a significant contribution to the bibliography of the whole range of educational subjects.

Das gesamte Erziehungs- und Unterrichtswesen in den Ländern deutscher Zunge: Bibliographisches Verzeichnis mit Inhaltsangabe der Bücher, Aufsätze und behördlichen Verordnungen zur deut-

schen Erziehungs und Unterrichts-Wissenschaft. Im Auftrage der Gesellschaft für deutsche Erziehungs- und Schulgeschichte, herausgegeben von KARL KEHRBACH. Jahrgang 3, 1898; Berlin, 1902; pp. 35+799, 8vo. Jahrgang 4, 1899; Berlin, 1903; pp. 38+823, 8vo.

It is very interesting and somewhat discouraging to read, in the prefaces of the successive annual volumes, of the difficulties which beset the conscientious editors of this monumental work (the purpose and plan of which is described in the SCHOOL REVIEW for October, 1900, and October, 1902), and of the concessions which they are obliged to make to their conception of an ideal bibliography. They began by trying to issue an *absolutely complete* record in *monthly*, parts with *every item* carefully annotated. This proved physically impossible with any reasonable resources or expenditure, and as long as they clung to such a plan the work kept getting farther behind time in appearance. Then, very reluctantly, with many apologies, with earnest reiteration of unwavering belief in their ideal program, and with hope that the backsliding may be only temporary, the frequency of issue has changed to quarterly and then to semi-annual; the scope has been narrowed by omitting the large number of *Jugendschriften* (a class, by the way, of doubtful value in such a list); the bulk has been diminished by omitting all descriptive notes for periodical articles and official publications; and all this without gaining very much of the three years and more that the work is now behind. It is greatly to be hoped that this enterprise may not be entirely overcome by its troubles and disappear altogether, as two or three more inconsiderable forerunners have done in Germany.

"Instruments de bibliographie pédagogique." Par C. V. LANGLOIS. (In his *Questions d' histoire et d' enseignement* [Paris, 1902], pp. 295–311.)

An unpretentious, but very interesting, summary of the principal guides to pedagogical literature in the United States, England, Germany, France, and Italy. The article appeared originally in the *Revue pédagogique.* The author deplores the lack of adequate bibliographical guides to the pedagogical literature of France, hopes for the early appearance of an *Année pédagogique*, and draws attention to the fact that nearly all the important enterprises in this field have been executed in Germany or the United States.

"Bibliographical Note." (In LAURIE MAGNUS, ed., *National Education* [London, 1901; pp. 303, 8vo], pp. 254–78.)

A list of about one hundred thoroughly standard and excellent titles on general educational topics. The authors included are nearly all British. The books named are all such as might well be added to any educational library, and as no pretense is made that the list is more than a selection from the best, it would be mere captiousness to criticise it for what is omitted. The titles given are meant to represent the history, methods, and status of national education in the nineteenth century in Great Britian, and to some extent in other countries.

Outlines of the History of Education as Offered in the University of Nebraska. By G. W. A. LUCKEY. New York, 1903. Pp. 131, 8vo.

These outlines were first printed as an appendix to Professor Luckey's *Professional Training of Secondary Teachers in the United States*, but are now available in separate form. They are the outgrowth of class-room work for eight years, and naturally challenge comparison with similar published class outlines by Professor Olin, of Kansas, in 1900, and Professor Cubberley, of Leland Stanford, in 1902. Professor Olin's work (noticed in SCHOOL REVIEW, October, 1901, p. 528) is much the briefest of all, both in lecture outlines and in reading references, although he includes a few references not found in either of the others. Professor Cubberley's volume (noticed in SCHOOL REVIEW, October, 1903, p. 684) is much the fullest of the three in lecture outlines, is the only one illustrated, and, while it contains as many or more bibliographical references as Professor Luckey's *Outlines*, is probably not so easy for the student to use because it omits detailed references to almost all the Poole periodical articles, except those in educational journals; it groups its references under each subject under several headings, while Professor Luckey lists his in a single alphabet. Then, too, the student finds many references in Professor Cubberley's book like the following example on p. 38 to Gall II, 1–16, and after turning over ten or twelve pages, and looking through four alphabets, to discover the title of the books, he finds that it is a German volume and of no use to him, so he goes back to try another author. The foreign titles might as well be nearly all omitted (as Professor Luckey does) from reference lists designed for undergraduate students, and the very simplest arrangement of the bibliography, which is what Professor Luckey has effected, will serve students best.

"Bibliography of Education for 1903." By J. I. WYER, JR., AND I. E. LORD. (In *Educational Review*, June, 1904 [Vol. XXVIII], pp. 38–90.)

This is the fifth annual number of this analytic, annotated list of the English literature of education. Four hundred and twenty-three items are selected as worth noting from the mass of educational books and articles for the year. The following are indicated by the compilers as fairly representing the cream of the year's product-books that should be bought by every library, and read by, or accurately known to, all serious students of education. The books are grouped by subject.

1. Dopp, *Place of Industries in Elementary Education.*
2. O'Shea, *Education as Adjustment.*

3. Judd, *Genetic Psychology for Teachers.*
4. Thorndike, *Educational Psychology.*
5. Royce, *Outlines of Psychology.*

6. Brown, *Making of our Middle Schools.*
7. Schwickerath, *Jesuit Education.*
8. Williams, *Mediæval Education.*
9. Adams, *Some Famous American Schools.*
10. Lewis, *Educational Conquest of the Far East.*

11. Religious Education Association, *Proceedings.*
12. Crooker, *Religious Freedom in American Education.*
13. Haslett, *The Pedagogical Bible-School.*
14. Burton and Mathews, *Principles and Ideals for the Sunday School.*
15. Mead, *Modern Methods in Sunday-School Work.*
16. Adams, *Primer of Teaching.*

17. Bailey, *The Nature Study Idea.*
18. Carpenter, *The Teaching of English.*

19. Eliot, *More Money for the Public Schools.*
20. Van de Warker, *Woman's Unfitness for Higher Co-education.*
21. Jordan, *Voice of the Scholar.*

22. Keller, *Story of My Life.*
23. Howe, *Laura Bridgman.*

FRANKLIN AND MARSHALL COLLEGE.

History of Franklin and Marshall College, 1787–1903. By J. H. DUBBS. Lancaster, Pa. Pp. 402, 8vo.

Pages 382–94 are devoted to bibliography, first of Franklin College 1787–1853, then of Marshall College 1836–53, and since 1853 of the united institutions. A note at the head of the list says:

This bibliography does not aim at completeness. At first it was proposed to include the publications of professors and alumni in so far as they had come to our knowledge, but it soon became evident that in this way the work would be extended beyond our limits. As it now stands, it includes specimens of the work of members

of the faculty, addresses delivered on public occasions, and a few books and pamphlets containing historical information. Except in a few instances, articles in periodicals have been omitted.

GERMANY—EDUCATION.

Bibliographie der deutschen Universitäten: Systematisch geordnetes Verzeichnis der bis Ende 1899 gedruckten Bücher und Aufsätze über das deutsche Universitätswesen. Im Auftrage des preussischen Unterrichtsministeriums bearbeitet von W. ERMAN UND E. HORN. Leipzig, 1904. Pp. 836, 8vo.

This stout volume of 836 double-columned pages is the result of fully sixteen years' work by both compilers. It collects the titles of all *general* works dealing with the German universities, leaving for Vol. II the special or particular literature relating to the single universities. It has been truly a herculean task, done with characteristic German thoroughness and unwearied industry, and the result is, despite some unsatisfactory minor features, an exceeding useful and wonderfully comprehensive guide. Seventeen thousand three hundred and sixty-three separate titles are listed under twenty-four main subject divisions, which are still further subdivided into two hundred and twenty-four minor sections. The arrangement under each section is strictly chronological, though in many, if not all, cases an alphabetical author arrangement would have facilitated reference. It is to be regretted that there are no critical notes. The compilers say in their preface that they did not appreciate the importance of annotation in the early part of their work, and when later they became convinced of the usefulness and desirability of this important feature of good bibliography, it was too late to recover the ground.

"Die Schulmänner der Reformation und ihre bedeutendsten pädagogische Schriften." (In G. MERTZ, *Das Schulwesen der deutschen Reformation* [Heidelberg, 1902], pp. 74–160.)

A contribution to German educational history.

GREAT BRITAIN—EDUCATION.

The Royal Authority and the Early English Universities: A Thesis for the Doctorate presented to . . . . the University of Pennsylvania. Philadelphia, 1902. Pp. 89, 8vo.

A four-page bibliography at the close refers to much source material, both manuscript and printed, relating to Oxford and Cambridge, with many additional references to secondary material. The author says in a note:

This bibliography is not intended to be complete. I have only noted those books either directly quoted in my footnotes or which stand as a basis for some of the ideas expressed in the text. This will account for the omission of chronicles and various college histories.

G. STANLEY HALL.

"Bibliography of the Published Writings of President G. Stanley Hall." By L. N. WILSON. (In *American Journal of Psychology*, July-October, 1903 [Vol. XIV], pp. 417–30.)

A chronological list of 196 titles published from 1867 to 1903.

HISTORY.

Special Method in History; A Complete Outline of a Course of Study in History for the Grades below the High School. By C. A. MCMURRY. New York, 1903. Pp. 291, 12mo.

The list of books, pp. 271–91, is arranged by grades. In each grade three groups of books are given; first, books which may serve as a text-book basis for more careful study; second, supplementary reading and source material which children may be encouraged to use at home and school; third, a few of the most important reference-books and helps for teachers. The entire list aims at definiteness for each grade, and tries to strike the middle line between too much and too little.

JESUIT EDUCATION.

Jesuit Education. By ROBERT SCHWICKERATH. St. Louis, 1903. Pp. 687, 12mo.

In this book, which is now the best English history of Jesuit education, on pp. 662–70 is found a list of about fifty of the most important works in English and other European languages treating directly or indirectly on the subject. Useful notes are appended to most of the titles. The extensive periodical literature of the subject is not attempted. This bibliography is much better and fuller than that in *Hughes-Loyola*, although there are several titles in the latter which are not found in Father Schwickerath's list.

SCHOOL ARCHITECTURE.

"A Bibliography of Works on Schools and Their Architecture." (In FELIX CLAY, *Modern School Buildings* [London, 1903]; pp. 480, 8vo.)

One hundred and fifty-one titles of books (mainly European) and periodical articles. No notes. This is the longest list known to me on

this subject, and while it makes no claims to completeness, it illustrates very well, when compared with other bibliographies of school architecture, how limited, unsatisfactory, and perfunctory are most of the lists of references appended to a book or a monograph and labeled "Bibliography." For example, in the SCHOOL REVIEW for October, 1900, p. 483, was noticed a list of forty-nine references accompanying Mr. G. B. Morrison's article in the first volume of Paris exposition monographs, and only thirteen of these are found in Mr. Clay's list, while in a little list of forty-nine titles in the Columbia University catalogue of books on education are seventeen titles found in neither of the first-mentioned lists.

SCHOOL GARDENS.

Bibliography of School Gardens. By ALBERT F. CARTER. Greeley, Colo., 1904. Pp. 20, 12mo. (Bulletin No. 4, Ser. 3, State Normal School, Greeley, Colo.)

"School Garden Bibliography." (In H. D. HEMENWAY, *How to Make School Gardens* [New York, 1903; pp. 107, 12mo], pp. 97–107.)

Each of these lists leaves very much to be desired in definiteness of citation, and especially in arrangement. The second one in particular is so confused and methodless as to be useless for easy reference. The Colorado list would better have been all in one alphabet and not cut up into the separate sections "Books," "Pamphlets," "Magazine Articles," "Reports."

SCHOOL LIBRARIES.

Bibliography of High-School Reference Books Recommended by the Committee on High Schools of the University of Colorado. Boulder, Colo., 1903. Pp. 83, 8vo. ("Investigations of the Department of Psychology and Education," No. 4.)

A thoroughly discreditable piece of work. The classification is confused and absurd. There is no uniformity in editing the various sections, but the various lists from different professors have evidently been printed just as sent in. The best books in certain sections, where there can be no difference of opinion, are omitted. Many sections seem to have been compiled for college libraries instead of high schools. The only good reason for noticing the pamphlet at all is to warn everybody against it.

Special Method in the Reading of Complete English Classics in the Grades of the Common School. By C. A. MCMURRY. New York, 1903. Pp. 254, 12mo.

Contains an excellent graded, annotated list of English masterpieces for Grades 4 to 8, with an index of titles. Practically three lists are given: books suitable for class-room use; supplementary reference-books for pupils; books for teachers.

SPELLING.

A Brief Bibliography of Simplified Spelling. By ELLA G. PARMELE AND ELIZABETH F. SIMPSON. Oshkosh, Wis., 1903. Pp. 8, 8vo.

This list of references was compiled by the librarians of two of the state normal schools for the use of the Committee on the Amelioration of Our Spelling of the Wisconsin State Teachers' Association. Eight separate books or notable chapters are first listed, followed by a chronological list of fifty selected references to periodicals and the *Proceedings* of the National Educational Association. Such titles as have been chosen (for the bibliography, is only a selection) are clearly set down, and, best of all, every one is followed by a brief note telling just what a user of such a list wants to know about it.

SUNDAY-SCHOOL TEACHING.

The Pedagogical Bible School: A Scientific Study of the Sunday-School with Chief Reference to the Curriculum. By S. B. HASLETT. New York, 1903. Pp. 383, 8vo.

Contains the completest and best selected bibliography of Sunday-school pedagogy that is in print. There is no good reason, though, why magazine articles should be listed in a separate alphabet.

Sunday-School Teaching. By W. W. SMITH. Milwaukee, 1903. Pp. 166, 12mo.

A very excellent little book for those who are studying how to make Sunday-school teaching more effective. It gives topical outlines for study, suggested questions for thought and discussion, and at the beginning of every outline a carefully chosen list of readings with references to the very pages or chapters which bear on the topic. A list on pp. 161–63 collects titles of all the books to which references have appeared in the outlines.

TEXAS EDUCATION.

History of Education in Texas. By J. J. LANE. Washington, 1903. Pp. 334, 8vo. (U. S. Bureau of Education, Circular of Information, No. 2, 1903.)

A bibliography is appended, of material used by the author in writing this history.

WOMEN'S COLLEGES.

"Reading List on Some of the Colleges for Women in the United States." (In *Monthly Bulletin of the Carnegie Library of Pittsburgh*, May, 1904 [Vol. IX], pp. 131–40.)

A few references, chiefly to the popular periodicals, on Barnard, Bryn Mawr, Mount Holyoke, Radcliffe, Smith, Vassar, Wellesley, Wells, and the Woman's College of Baltimore. The list will be especially useful in small public libraries.

J. I. WYER.

UNIVERSITY OF NEBRASKA LIBRARY.

EDITORIAL NOTES.

GEORGE HERBERT LOCKE.

THE sober-minded business man of today looks for results and listens but indifferently to one who endeavors to demonstrate theoretically the value of a new method. The question of whether it will work economically and efficiently is uppermost in his mind, followed closely by the almost equally important one of whether there will be a market for the product. In these days of glib promoters who can demonstrate the possibility of extracting gold from salt water so that even the New England Yankee loses his head and parts with his money, that which is new must prove pretty conclusively its right before it can be allowed to supersede the old and tried. As has often been remarked in these pages, education does not differ materially from business, and it too has suffered from the glibness of promotion. Instead of men having ideas, and examining these ideas with a view to rational experimentation before adoption, the ideas take possession of the men, and what had in it much of promise, had the analysis been made and the defects removed or amended, becomes a fad and easily assailable on account of these deficiencies.

AN ATTRACTIVE AND SENSIBLE PRESENTATION OF THE VALUE OF MANUAL TRAINING

The friends of a movement are often its worst enemies. The unthinking person carried away by the impulse of the moment, having a superabundance of faith, but with no sufficient reasons for that faith, exposes the movement to ridicule, and thus injures the cause which he in good faith is trying to aid. Manual Training is one of the latest sufferers in this way, and therefore it is with genuine pleasure that one reads Booker Washington's latest book, *Working With the Hands*, the simple recital of the upbuilding and development at Tuskegee. The person who seeks the philosophical principles will find them simply and clearly explained and he who looks for "tangible results" will find them equally apparent The keynote of this whole movement which has attracted attention the world over is found in the first chapter, where he tells of a so-called "rich and exacting personage" for whom he worked when a boy and who taught him the value of work exactly done. Her treatment of him reminds one of Kipling's training of "The 'Eathen" who is constantly reminded to

> Keep away from dirtiness, keep away from mess,
> Keep away from doin' things, rather more or less.

The young Washington worked hard, but had to go over the job a number of times before he satisfied his exacting employer. But he had never dreamed that

a bit of work could look as well, nor had he imagined that so much *thought* was necessary to the successful completion of a bit of manual work. As he says:

> When I saw that all this was a creation of my own hands my whole nature began to change. I felt a self-respect, an encouragement, and a satisfaction that I had never before enjoyed or thought possible. Above all else, I had acquired a new confidence in my ability actually to do things and to do them well. . . . . As I began to reap satisfaction from the works of my hands, I found myself planning over night how to gain success in the next day's efforts.

When he took up his life work at Tuskegee he faced these questions: What can these young men and women find to do when they return to their homes? What are the industries in which they and their parents have been supporting themselves? Washington went to work in downright earnest to see what could be done in the way of teaching the intelligent use of hands and brains on the farm, not by theorizing, but by practical effort. The story of Tuskegee is but the development of this ideal under changing conditions, under many early discouragements, but emerging at length in triumph.

Washington's philosophy and method may be illustrated by a citation from the chapter *A Battle Against Prejudice* in which he says:

> My first effort was to try to help the masses through the medium of the thing that was nearest to them, and in which they had the most vital and practical interest. I knew that if we could teach a man's son to raise forty bushels of corn on an acre of ground which had before produced but twenty bushels, and if he could be taught to raise this corn with less labor than before, we should gain the confidence and sympathy of that boy's father at once.

There is a grim humor and a deal of common-sense in Washington's application of this doctrine to the missionary work of our churches:

> In this connection I have often thought that missionaries in foreign countries would make greater progress if at first more emphasis were placed upon the industrial and material side than upon the purely spiritual side of education. Almost any heathen family would, I believe, appreciate at once the difference between a shack and a comfortable house, while it might require years to make them appreciate the truths of the Bible. Through the medium of the home the heart might be reached. Not long ago I was asked by a missionary who was going into a foreign field what, in my opinion, he ought to teach the people, and how he ought to begin. I asked him what the principal occupation of the people was among whom he was going, and he replied that it was the raising of sheep. I advised him, then, to begin his missionary work, by teaching the people how to raise more sheep than they were raising and better sheep, and said that I thought the people would soon decide that a man who could excel them in the raising of sheep might also excel them in the matter of religion, and that thus the foundation for effectual mission work might be laid.

Washington found in his school, just as we find in all our schools today, that the most stubborn of all difficulties in the way of educational development is the blind faith in books, and the feeling that books and school are almost synonymous terms. That this is very general may be seen from the fact that it formed the basis for a very satirical song in a recent comic opera where a number of young

girls recited some very ludicrous and impossible adventures, and when questioned showed their little schoolbooks and chanted: "We've read it in our books, and it must be so."

But this method of manual training, this combination of brain and brawn, developed not only truthfulness, accuracy, and honesty, but it developed the idea of a common interest, and with the growth of a social ideal the work of real education becomes hopeful to those engaged in it.

In such an institution as this there must be two kinds of students—those who spend most of the day at more less definite school work, and those who are charged with the responsibilities of the ever-growing manual interests outside, and who therefore must study in the evenings. Mr. Buttrick, who wrote in our September issue that earnest plea for the evening high school, will be pleased to hear that concerning the students in the evening school Washington says:

> A student who studies two hours a night and works with his hands ten hours during the day naturally covers less ground in the text-books than the day student; yet in real sound growth and the making of manhood I question whether the day student has much advantage over the student in a night school. There is an indescribable something about work with his hands that tends to develop a student's mind. The night-school students take up their studies with a degree of enthusiasm and alertness that is not equaled in the day classes.

And so throughout this interesting book which tells of the daily life of this community of workers, the ideals and the practices governing the conduct of these sixteen hundred devoted persons, one may find inspiration and suggestion that will be of especial value to him if engaged in the teaching profession. We are living in a matter-of-fact age where the question asked of each of us is: "What have you done?" We tire of the too numerous persons, even in the profession of teaching, who remind one of Tomlinson who, when asked on what grounds he expected to be allowed to enter heaven, said:

> This I have read in a book,
> And this was told to me,
> And this I have read that another man read
> Of a Prince in Muscovy.

But the question was still asked: "What have you done?" Now, it is just this question that Washington has answered with his reasons for his action and a faithful record of the results. Hence the particular value of this book in this age.

THE REPORT OF A USEFUL PUBLIC LIBRARY

We have many ornamental libraries in this country, handsomely housed and equipped, but with so much beautiful machinery that the uninitiated entering the portals hesitates to touch anything for fear of disarranging the mechanism and suffering reproof. The books safely stowed away in the cold-looking stacks behind the forbidding desk, the mysterious card catalogue which seems to suggest that one's mind ought to be remade and classified according to some prevailing system, and the dethroned empresses at the desk who condescend to answer one's questions—

all these combine to discourage one from hoping to derive pleasure from the use of this mausoleum. The number of such libraries is growing less because the public is becoming alive to the fact that a public institution, supported by public money should be positively useful; it should not only afford information to those who are venturesome enough to ask it, but should publish useful information bearing upon current problems so that men will have their minds turned toward those things which are today of vital importance. We have too many institutions in our communities which are useful only to those who discover them, but concerning the purpose of which the general public knows little or nothing, because there is no effort on the part of the institutions themselves to define their functions and invite the public to share in their privileges. A catalogue is at best a dreary waste, but when a card catalogue is the only method of approach to the literature contained in a public library, there can be but little hope that the institution will reach the very people who need it most. We ought to have most of our stackroom open to the public, or we ought to have a greater number of books accessible so that a person may wander among books and perhaps browse by the way. This may not commend itself to some of our librarians, who seem to be the embodiment of their own card-catalogue system, and who imagine themselves the owners of the books of which they are only the custodians. The ordinary citizen who goes to a public library has often a very vague idea of what he wants, and if he were permitted to wander among a lot of books, he might discover something that interested him, and the perusal of which would not only give him pleasure, but make him more valuable to himself and to others. It is an exceptional man who enters a library knowing exactly what he wants, just as it is the exceptional man who enters a store with a well-planned scheme of what he wishes. He looks around and finds many attractive things the existence of which he had not thought of, and the merchant who is a practical psychologist and has studied the situation arranges his wares in a tempting fashion. The world of business has many lessons which we ought to learn, and psychology is an ancient science in the practical world.

The possibilities of the public library for civic usefulness is well illustrated by the latest report of Mr. J. C. Dana, the librarian of the public library in Newark, N. J. There are in this report so many interesting and sensible ways of promoting public interest, and of satisfying public, institutional, and personal wants, that we recommend it to our teachers who presumably have an interest in developing the public library in their own communities. The information desk has a place in this library where anyone unfamiliar with the workings of a catalogue, with books of reference or the indexes to periodicals, may receive prompt and kindly help. Near the desk is a special topic case where books on themes of current interest are gathered. There is also a small case of "Interesting Books" chosen from day to day from the main body of the library, and in other parts of the room one sees "One Hundred of the Best Novels," "One Hundred Interesting Biographies," "New Books of the Past Two Months," "Books on Business," etc. This is a case of browsing in selected meadows.

The relation of this library to the community is illustrated very nicely by the qualities of leadership which the library assumes. It is not an institution which merely takes care of books, but it sets out distinctly to influence public opinion toward the best things, and to help the industrial as well as the more purely intellectual development of the community. From time to time the librarian issues short lists of books on practical Newark subjects—varnishes, tanning, printing arts, etc. A copy of each list is pasted inside the cover of every book mentioned in the list. An instance of the practical nature of this scheme is the relationship between the library and the business colleges of the city. There are four of these, with over two thousand students. The librarian prepared a carefully selected list of one hundred and fifty books on business, had copies printed, and circulated in the colleges, and thus has revealed to these students a vast mine of useful knowledge which otherwise would have remained undiscovered.

The restrictions in borrowing books from a library have always been irksome to some readers, although necessary to the proper business management. Mr. Dana has adopted some very liberal provisions, and they seem to work out satisfactorily under his management. For instance, he allows anybody to have two books at a time, and as many more as he pleases, excepting recent novels, on condition that the borrower brings the books in person to the library once a month for renewal, and provided that no one else has asked for the books. It is found that this plan encourages some persons to pursue consecutive courses of study who might otherwise become discouraged, hampered by the many restrictions of the ordinary system of borrowing.

The connection of the public library with the public schools is especially interesting to us. During last year 6,307 books were sent to thirty-seven different schools, passing directly from the class-room to the children, with a total circulation for the twelve months of 45,503. In this way the books chosen jointly by librarians and teachers are such as cultivate a taste for the best literature and are immediately available for use in the schools in a systematic manner. This method of distribution through the schools is the best that one could devise, were his object the greatest diffusion of reading matter in a community. The children are the best circulating mediums and advertisers, for they assert their claims to attention and explanation, and always with success. It is not uncommon for a teacher to receive a note from a parent asking if it is possible for the child to bring home next time a book which she has mentioned as being in the school library and which the parent would like to read.

Mr. Dana has recognized the value of the pictorial element in education, and has taken thousands of illustrations, chiefly from periodicals, sorted them into classes, and placed them in manila folders. These collections are lent to schools for the purpose of illustrating history, mythology, nature-study, Arbor Day, Bird Day, etc. There have also been two loan exhibitions of pictures during the year, with an attendance of over sixty thousand persons. The building is certainly of real benefit to the community without regard to the library proper, for we read that during the year 261 meetings—charitable, educational, and social—were

held within its walls, and Mr. Dana hopes that out of this may be developed an institution which shall serve American cities as the home and focus of educattional, charitable, and civic work.

One lays down this report with a sense of gratification that there are men who realize the possibilities in their professions, and who point out the way to the many thousands to whom the work is only a trade involving the mastery of details.

BOOKS RECEIVED.

[This notice here given does not preclude the publishing of a comprehensive review.]

A History of the United States for Secondary Schools. By J. N. LARNED. Boston: Houghton, Mifflin & Co. Pp. 623+78. $1.40.

This is a large volume, with copious notes, topics, suggested readings, and an atlas of historical maps. It is intended for use in the last year of the high school in accordance with the recommendation of the Committee of Seven, and seems well adapted for its purpose. One might perhaps register a complaint against the unnecessary frequency of the side-heads in the makeup of the book. This seems a pedagogical sin which is becoming more common.

Sievers's Grammar of Old English. Revised edition by ALBERT S. COOK. Boston: Ginn & Co. Pp. 422. $1.60.

This is the third revised edition of this well-known work.

Eastward Ho. By JONSON, CHAPMAN AND MARSTON. And JONSON'S *The Alchemist.* Edited by FELIX E. SCHELLING. Boston: D. C. Heath & Co. Pp. 408.

We congratulate the publishers on this charmingly designed book, and hope that the "Belles-Lettres" series will be a success. The opening numbers are certainly of great promise.

Chapters on English Metre. By JOSEPH B. MAYOR. New York: The Macmillan Co. Pp. 308. $1.50.

This is the second edition, revised and enlarged. Chapters on the Metrical Systems by Dr. Skeat and Mr. Robert Bridges, on Shelley's meter, and on the English hexameter have been added. This book ought to be in the working library of every teacher of English in our high schools.

Practical Lessons in Human Physiology. By JOHN I. JEGI. New York: The Macmillan Co. Pp. 343. $1.

Personal hygiene and public health are given prominence in this book. The style is chatty and hortatory, and suggests a course of lectures on the subject. We are inclined to doubt the wisdom of printing at the end of each chapter a summary of the main points. It looks as if one might take either the chapter *in extenso*, which is not a very great mental effort, or take the digest of it. At any rate, the student is spared the intellectual labor of making a summary.

Hero Tales. By JAMES BALDWIN. New York: Charles Scribner's Sons. Pp. 182. $0.50.

This book fully sustains the reputation of its predecessors in this series, and is just the sort of book one might reasonably expect boys to be interested in—a book that will develop in him a desire to read further of these great men of ancient days.

The Roosevelt Book. With an Introduction by ROBERT BRIDGES. New York: Charles Scribner's Sons. Pp. 189. $0.50.

This book is made up of extracts from various books and addresses by President Roosevelt, well chosen and well arranged.

Zoölogy—Descriptive and Practical. By BUEL P. COLTON. Boston: D. C. Heath & Co. Pp. 375+204.

The preface at once shows the hand of the teacher, and the eminently practical suggestions made there encourage one to read the book. This ought to be a very valuable handbook on a subject not too well taught in our schools.

A Primer of English Literature. By ABBY WILLIS HOWES. Boston: D. C. Heath & Co. Pp. 190.

The author modestly declares that this book strives to tell simply and clearly a few things, and to bring prominently before the reader only the greatest literary names; and we think the effort has been successful.

Plane Surveying. By SAMUEL M. BARTON. Boston: D. C. Heath & Co. Pp. 255.

This is a brief treatise adapted for a short course in colleges or as a preparatory course in technological institutions.

Advanced Course in Algebra. By WEBSTER WELLS. Boston: D. C. Heath & Co. Pp. 582.

A review of this and the preceding work will appear shortly.

Territorial Acquisitions of the United States. By EDWARD BICKNELL. Boston: Small, Maynard & Co. Pp. 138.

This is a useful little handbook, written in an interesting style and containing valuable information.

Marcus Tullius Cicero. TEN ORATIONS. Edited by R. A. VON MINCKWITZ. New York: The Macmillan Co. Pp. 518. $1.25.

This seems a ponderous volume, and in looking over it one is tempted to again raise the question as to the advisability of elaborate introductions (in the case of 67 pages), extensive notes (145 pages), and a seemingly large vocabulary (over 100 pages). We shall soon vie with the three-volume novel of old England.

Mary of Magdala. Translated from the German of Heyse by WILLIAM WINTER. New York: The Macmillan Co. Pp. 135. $1.25.

This historical and romantic drama in five acts has been produced in this country with great success by Mrs. Fiske, and, unlike many of the plays of today, will abundantly repay the perusal of it in book form.

The Elements of Arithmetic. By J. W. HOPKINS AND P. H. UNDERWOOD. New York: The Macmillan Co. Pp. 546. $0.55.

The authors state as their aim: "to give a simple, clear, and rational development of the principles of arithmetic and to illustrate these principles by an abundance and a variety of examples taken from every day life." There is a familiar ring to this, and indeed the book reminds one of the happy number days. Some of the concrete prob-

lems that one sees in glancing through seem appropriate, but the laws of rational education seem to receive a sad jolt when one sees forty-eight examples of division, fifty of decimals, etc., etc. Some of us seem never to get beyond the maxims, "Learn to do by doing," and "Practice makes perfect." These are responsible for much harm in education.

Aristotle on Education. By JOHN BURNET. New York: The Macmillan Co. Pp. 141. $0.60.

If one would understand the problems of education as they occur in our everyday life in America, he must read Aristotle and Plato. They wrote for all time and founded schools of thought rather than schools of mere practice. Aristotle has not always received his fair share of attention from educators, as his position is not as easily analyzed as is that of Plato. Hence we welcome this little book, which we may place beside Bosanquet's *Education of the Young in the Republic of Plato.* Mr. Burnet makes a very interesting point in his introduction, where he shows how Aristotle raised the issue about which we dispute so much and to so little purpose today, viz, "Is the end of education culture, or is it to fit us for the business of life?"

Elements of Inorganic Chemistry. By. H. C. JONES. New York: The Macmillan Co. Pp. 343. $1.25.

An interesting method of arrangements characterizes this book and is worthy of imitation. The experiments are placed at the ends of the chapters so that the text is made continuous and more readable. If only for the purpose of compelling the student to review the text in connection with the experiment, we believe it would be a wise plan. There seems to be sound pedagogical methods in this book.

Goldsmith's Good Natured Man and She Stoops to Conquer. Boston: D. C. Heath & Co. Pp. 29+289.

This is in the new and attractive "Belles-Lettres" series of English classics. The introduction and biographical and critical material are by Austin Dobson, and the text has been collected by George P. Baker, the general editor of the series.

Selected Letters of the Younger Pliny. Edited by E. T. MERRILL. New York: The Macmillan Co. Pp. xliii+473. $1.25.

We hope that these letters will be more widely read than they have been. They tell of a life that is not remote from ours, and one turns from the annals and records to the individual in a social world with a keenness that has not been taken into account by some of the framers of curricula who are wedded to ideas of mental discipline.

An English Heroic Play. By LEWIS N. CHASE. New York: The Macmillan Co. Pp. 250. $2.

Like Mr. Harrison's book on *Platonism* noticed elsewhere, this is one of the products of graduate study in Columbia University under Professor Woodberry, and deals with another aspect of English literary history. It is a study of the English tragic drama of the latter half of the seventeenth century, and the particular part dealt with here is the Critical Survey of the plays with a view of determining their type.

Our Bodies and How We Live. By ALBERT F. BLAISDELL. Boston: Ginn & Co. Pp. 352. $0.65

This is a revised edition of a familiar book. It is rewritten, rearranged, and has many additional illustrations.

Australia, Our Colonies and Other Islands of the Sea. By FRANK G. CARPENTER. New York: The American Book Co. Pp. 388. $0.60.

This is the latest addition to the interesting series of books by Mr. Carpenter and while some may criticise the lack of detail and the reportorial style, yet for the purpose of supplementary reading in the grades it will be difficult to suggest an adequate substitute. Carpenter is always interesting and gives a view of the countries with good proportion as to the important features.

Supervision and Education in Charity. By J. R. BRACKETT. New York: The Macmillan Co. Pp. 222. $1.

This is a distinctly valuable work in the field of philanthropy, and should be read in all women's clubs and other organizations which have a distinctly social and philanthropic aim.

The Evolution of Modern Liberty. By GEORGE L. SCHERGER. New York: Longmans, Green & Co. Pp. 284.

In this work the author has endeavored to trace the genesis and development of the political theories embodied in the Bills of Rights and in the French Declaration of the Rights of Man, and to show that these documents are the results of a long development. As the treatment is limited to the historical side, the work has a decded interest for the teacher of history in a secondary school.

A Text-Book of American History. By W. E. CHANCELLOR. New York: The Morse Co. Pp. 653.

This is a breezy production. After reading the first paragraph of the preface, one turns back to the title-page to make sure that the author has not come from our western plains—the land of great things. But the description tells us of only the East, and with surprise we read this grandiloquent sentence: "We now meet upon our horizons in business and in politics, the other nations of the world as the greatest of them all. We are the first democratic empire in universal history, etc." He guards against criticism by a formidable list of collaborators, and the plan of the history is said to "represent a composite of the views of many men of the highest professional standing." It is illustrated, but rather overdone, and we cannot agree with the practice of questions, even for review, being printed at the end of each chapter. It may spare the teacher some labor, but it is just that kind of labor that ought to be done.

The Leading Facts of French History. By D. H. MONTGOMERY. Boston: Ginn & Co. Pp. 328+xxvii. $1.12.

The object of this volume is to present the most important events of the history of France, selected, arranged, and treated according to the soundest principles of historical study, and set forth in a clear and attractive narrative.

Demosthenes on the Crown. Edited by W. W. GOODWIN. New York: The Macmillan Co. Pp. 296. $1.10.

This is an abridgment of the great edition of Professor Goodwin, published by the Cambridge University Press, and is intended for class use. That the work is well done needs not to be said by us, for those who have had the pleasure of hearing Mr. Goodwin, and even of reading his comments on the life of the Athenians, will welcome with pleasure this commentary on the great speech of Demosthenes. It were worth while to study Greek if only to have read and appreciated this speech.

A Senior School Poetry Book. Edited by W. PETERSON. *A Junior School Poetry Book.* Edited by W. PETERSON. New York: Longmans, Green & Co. Pp. 276 and 144.

We agree with Principal Peterson that the reading of poetry and the learning of the same should be revived in our schools, and therefore we welcome such books as he has edited for us. True, they are primarily from English authors, but with a catholicity of taste that forgets national boundaries, or remembers them only to try to obliterate them we find him quoting largely from our poets, and thus making books suitable for use in our own country. Bryant, Bret Harte, Holmes, Hovey, Howe, Longfellow, Lowell, Poe, Whitman, Whittier, Emerson, Field, Prentiss, Roberts, and Smith are representative authors whose poems are quoted. The editor has been singularly felicitous in his selection of poems and in his arrangement of them. In many cases he seems to have been guided by the psychological instinct, and so has gained immeasurably in force and suggestiveness. For instance, the poem by Sangster on "The Plains of Abraham" is followed by Gray's "Elegy," recalling at once to our minds the memorable night before the battle on those plains when Wolfe quoted this poem to his soldiers as they approached the city by way of the river. We could multiply these instances to show the great possibilities in editorship, and how well Mr. Peterson has used these possibilities.

Samuel Chapman Armstrong. By EDITH ARMSTRONG TALBOT. New York: Doubleday, Page & Co. Pp. 301. $1.50.

Biography should fill a more important part of our school and home libraries than it does at present. In this busy, practical world it seems the fashion to seek books which give definite instruction or fleeting pleasure. The old-fashioned teaching through inspiration and suggestion, and the equally old-fashioned pleasure of reading of what others have accomplished in their desire to render social service, have been pushed aside especially in our high schools. Just such a book as this is the kind that ought to be in every high-school library. It tells of a life of devotion to a high purpose of a man who actually contributed in a tangible way to human progress, who lived in stirring times, and who was instrumental in helping to solve some of our vexed problems as a nation. The beginnings of the work at Hampton read like a romance, and reading of the intrepidity and far-sightedness of the soldier-teacher will do more to stimulate boys to greater and nobler things than all the lessons on civics from the latest and best text-books. Inspiration is what we need in this adolescent period of childlife, and lives of such men as Armstrong furnish us with the power.

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